

**GUTEZA IMBERE UMUCO WO  
GUHIGANWA, KWITA KU  
BUZIRANENGE N'UBWIZA  
BW'UMUSARURO UKOMOKA KU  
MBOGA N'IMBUTO BINYUZE MU  
KUBAHIRIZA AMABWIRIZA YO KWITA  
KU MUSARURO NYUMA YO  
GUSARURA**

**UMWIHARIKO KU MUSARURO W'IMITEJA MU  
RWANDA**



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# GUTEZA IMBERE UMUCO WO GUHIGANWA, KWITA KU BUZIRANENGE N'UBWIZA BW'UMUSARURO UKOMOKA KU MBOGA N'IMBUTO BINYUZE MU KUBAHIRIZA AMABWIRIZA YO KWITA KU MUSARURO NYUMA YO GUSARURA

UMWIHARIKO KU MUSARURO W'IMITEJA MU RWANDA



**Umwanditsi:** © Benson Shivachi

## **Impugukirwa**

Iyi yandiko yakozwe ku nkunga y'Umuryango w'Ubumwe bw'Ibihugu by'Iburayi. Ibitekerezo bikubiyemo ntibyafatwa na busa nk'aho ari igitekerezo cy'Umuryango w'Ibihugu by'Iburayi.

## Ibirebana n'iyi nyigo

Ingamba zo kubungabunga umusaruro nyuma yo gusarura ndetse no kugabanya ibihombo ku musaruro ku miteja uhereye mu isarura, kuyibika no kuyitwara ijya aho itunganyirizwa bikenera ko Umuhinzi w'Imiteja yita ku guhanga udushya ariko dutahenze ndetse no gukurikiza imirongo ngenderwaho ikwiye yo kwita ku miteja.

Ubwoko turi bwiteho muri iyi nyandiko ni imiteja ihingirwa koherezwa mu mahanga. Igihingwa cy'imiteja cyatoranyijwe ku mwanya wa mbere mu rwego rwo kuzamura umuhigo w'iterambere ry'imboga kubera ko mu Rwanda, urebeye mu ngano, iki gihingwa cyihariye 70% y'ibyo ba Rwiyemezamirimo bato n'abaciriritse bohereza ku masoko yo mu bihugu by'Umuryango w'Ubumwe bw'i Burayi ndetse no mu Bwongereza. Gusa na none, iki gihingwa kiracyagaragamo ibihombo by'umusaruro wangirika nyuma y'isarurwa urebeye nko ku musaruro ubarirwa muri 40%-45% utabasha koherezwa mu mahanga kubera uba utujuje ibisabwa bigatuma ujugunywa cyangwa ugacuruzwa ku masoko atandukanye ya hano mu Gihugu kuko uba yashyizwe mu cyiciro cya kabiri mu birebana n'ubwiza.

Iyi nyandiko yafashwe nk'imfashanyigisho, kandi yateguwe mu buryo bwumvikana neza bituma uyisoma wese abasha kumva amahame shingiro yo kurinda umusaruro nyuma y'isarura ndetse no kubungabunga ubwiza bwawo.

## Gushimira

Ndashimira cyane Umuyobozi Mukuru wa NAEB, Umuyobozi Mukuru ushinzwe ibikorwa ndetse n'ikipe yose ya NAEB ku bufasha bahaye impuguke z'Ishami ry'Umuryango w'Abibumbye ryita ku bucuruzi (ITC) byatumye zikorera mu mwuka mwiza ku buryo byafashije mu gukora isesengura no kwandika iyi mfashanyigisho ku kubungabunga umusaruro nyuma yo gusarura. By'umwihariko turashimira Bwana MUNYANEZA Jean Marie Vianney, Umuyobozi w'Ishami rishinzwe ibihingwa bishya ku cyerekezo cyiza afite mu guteza imbere uwego rw'Imboga, Ibuto n'Indabo mu Rwanda; Bwana MUGABUSHAKA Norbert ku bumenyi butandukanye yadusangije ku birebana na tekini zo kongerera agaciro umusaruro na Eng. RUGANINTWALI Eric, Umuyobozi w'Ishami rishinzwe gukurikirana ubwiza n'ibijyanye n'amabwiriza y'ubuziranenge y'ibyoherezwa mu mahanga bikomoka ku musaruro w'ubuhinzi n'ubworozi muri NAEB kudasangiza ku rugendo rwo gutangiza gushaka icyemezo cy'imikorere myiza (QMS) muri NAEB hamwe n'intumbero ifatanyije n'ishyamba afite mu guteza imbere ubuziranenge mu rwego rw'imboga, imbuto n'indabo. Ubundi bufasha nanone bwatanze n'Abikorera bohereza Imboga n'Imbuto mu Mahanga baduhanye amakuru y'ingenzi ku bijyanye n'icyuho kiboneka mu bijyanye no kubungabunga umusaruro w'imiteja ku mirima yabo nk'uko byagiye bigaragazwa ku mirima itandukanye ndetse no ku ma site atandukanye akusanyirizwaho umusaruro.

Ndashaka gushimira ikipe y'abakozi ba NAEB bakora mu nzu yakirirwamo umusaruro w'imboga, ukahatunganyirizwa ndetse ukanahapakirirwa mu gihe uba ugiye koherezwa mu mahanga aribo Bwana MWALIMU Innocent na Madame MUSHIMIYIMANA Annonciata ku bushishozi bakorana mu kwakira no kubungabunga umusaruro mu gihe ugejejwe mu nzu utunganyirizwamo uzanywe n'abohereza umusaruro mu mahanga batandukanye bahakoresha, ukanahapakirirwa ugiye koherezwa mu Mahanga.

## Amagambo ahinnye yo mu ndimi z'amahanga

BOPP	Biaxially Oriented Polypropylene
BRC	British Retail Consortium
EAC	East African Community (Umuryango w'Ibihugu bya Afurika y'Iburasirazuba)
ETI	Ethical Trade Initiative
EU	European Union (Umuryango w'Ibihugu by'Iburayi)
FAO	Food and Agriculture Organisation (Ishami ry'Umuryango w'Abibumbye ryita Biribwa n'ubuhinzi)
FSSC	Food Safety Standard certification
GAP	Good Agriculture Practices
GHP	Good Hygiene Practices
GLOBAL GAP	Global Good Agriculture Practices
GSFI	Global Food Safety Initiative
HACCP	Hazard Analysis Critical Control Points
ITC	International Trade Centre (Ishami ry'Umuryango w'Abibumbye ryita ku Bucuruzi)
MARKUP	Market Access Upgrade Programme
MRL	Maximum Residue Limit
MSDS	Material Safety Data Sheet
NAEB	National Agriculture Export Development Board (Ikigo cy'Igihugu Gishinzwe guteza Imbere Ibikomoka ku Buhinzi n'Ubworozi)
PHI	Pre-Harvest Intervals
PPE	Personnel Protective Equipment's
PVS	Private Voluntary Standards
RS-HACCP	Rwanda Standard-Hazard Analysis Critical Control Point
SDGs	Sustainable Development Goals (Gahunda y'Intego z'iterambere Rirambye)
SMEs	Small Medium Enterprises (Ba Rwiyemezamirimo bato n'Abaciriritse)
SNV	Netherlands Development Organisation (Umuryango uharanira iterambere w'Abahorande)
UK	United Kingdom (Ubwongereza)
USD	United States Dollar (Amadorari ya Amerika)
WHO	World Health Organisation of United Nations (Ishami ry'Umuryango w'Abibumbye ryita ku buzima)
WTO	World Trade Organisation of United Nations (Ishami ry'Umuryango w'Abibumbye Riteza Imbere Ubuhahirane)

## Umusogongero

Ba rwiyemezamirimo bato n'abaciriritse (SMEs) mu buhinzi n'ubucuruzi bw'imboga, Imbutu n'Indabo mu Rwanda bahura n'uruhuri rw'ibibazo mu gice kirebana no kubungabunga umusaruro mu gihe cyo gusarura, mu kuwubika ndetse no kuwutwara bawerekeza aho utunganyirizwa. Inyungu igabanyuka bitewe n'ibihombo biterwa n'umusaruro wangirika mu rwego rwo hejuru haba ku murima ndetse n'aho ubikwa bitewe n'uko hari igihe haba hatujuje ibisabwa ngo habashe kubika umusaruro w'ibintu bibisi, kutagira uburyo bwo kongerera agaciro umusaruro ndetse no kutagira ibikorwa remezo bihagije. Inyigo ku ruhererekane nyongeragaciro yasabwe na Porogaramu ishamikiye ku ishami ry'umuryango w'Abibumbye ryita ku bucuruzi (ITC) igamije kuzamura uburyo bwo kugeza ibicuruzwa ku isoko (Market Access Upgrade Programme-MARKUP) muri 2019 yagaragaje imbogamizi zitandukanye abohereza ibintu mu Bwongereza no mu bihugu by'Umuryango w'Ubumwe bw'Iburayi bahura nazo. Zimwe mu mbogamizi zagaragajwe harimo ikibazo cy'Ubwikorezi mu ndege, imibonekere y'inyongeramusaruro, iyangirika ry'umusaruro riterwa n'ubumenyi budahagije, ba rwiyemezamirimo bato n'abaciriritse bagifite icyuho ku ikoranabuhanga mu buhinzi, uburyo bwo kubona igishoro/Amafara, amasoko, uburyo bwo gupfunyika ndetse n'ibindi.

Ukurikije imibare ya ITC, habayeho izamuka rihoraho ry'ibinyamisogwe bibisi ndetse n'imboga byoherezwa mu mahanga biva mu Rwanda guhera muri 2014 ku buryo byateye izamuka ku mafaranga byinjiza mu gihugu kuva ku madorari ya Amerika 4,520,000 akagera kuri 39,640,000. Imiteja niyo iza ku isonga mubyo u Rwanda rwohereje hanze kuko yihariye 70% y'ibyoherajwe mu Bihugu bigize Umuryango w'Ubumwe bw'Iburayi (NAEB 2018).

Umusaruro w'imboga, imbutu n'indabo ndetse no kuwutunganyiriza koherezwa ku masoko yo hanze uvuye mu Rwanda bihura n'imogamizi nyinshi zishingiye cyane cyane ku bumenyi budahagije muri byo, icyuho muri Tekinoloji gituma hangirika umusaruro mwinshi w'imbutu n'imboga wakabaye wohereweza mu mahanga. icyo gihombo cy'umusaruro wangirika utera kandi igabanyuka ry'ingungu abarimo babona, igiciro gito gihabwa umuhinzi ndetse n'ibijugunywa bikiyongera. Umubare munini w'abahinzi bacitse intege kubera ingano y'umusaruro ujugunywa bitumba ndetse bamwe mu bahinzi bava muri ubwo buhinzi cyangwa se bakagabanya ubuso bahingaho.

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# IGICE CYA 1: IRIBURIRO

## 1.1 Imbibi z'iyi nyigo n'Ibikubiyemo

Iyi nyandiko igamije gukemura ibibazo byo kubungabunga umusaruro w'imiteja no gushyiraho ingamba zo kugabanya ibihombo biterwa n'iyangirika ryawo kuva mu isarura, mu kuyibika ndetse no mu kuyitwara iva ku murima ijyanwa aho itunganyirizwa. Ibi bizakorwa binyuze mu ku guhanga udushya ariko dutahenze ndetse no gukurikiza imirongo ngenderwaho ikwiye yo kwita ku miteja bikozwe n'abahinzi b'imiteja.

- **Ubwoko bw'imboga burebwa n'iyi nyandiko:** Imiteja y'ubwoko bwose (*Phaseoullus vulgaris L*) Ihingirwa koherezwa mu mahanga. Igihingwa cy'imiteja cyatoranyijwe ku mwanya wa mbere mu rwego rwo kuzamura umuhigo w'iterambere ry'imboga kubera ko mu Rwanda, urebeye mu ngano, iki gihingwa cyihariye 70% y'ibyo ba Rwiyemezamirimo bato n'abaciriritse bohereza ku masoko Ibihugu by'Umuryango w'Ubumwe bw'i Burayi ndetse no mu Bwongereza. Gusa nanone, iki gihingwa kiracyagaragamo ibihombo by'umusaruro wangirika nyuma y'isarurwa urebeye nko ku musaruro ubarirwa muri 40%-45% utabasha koherezwa mu mahanga kuberako uba utujuje ibisabwa bigatuma ujugunywa cyangwa ugacuruzwa ku masoko atanduknye ya hano mu Gihugu kuko uba washyizwe mu cyiciro cya kabiri mu birebana n'ubwiza
- **Ibigo birebwa n'iyi nyandiko:** Ba Rwiyemezamirimo bato n'abaciriritse bohereza imiteja mu Bihugu bigize Umurango w'Ibihugu by'Iburayi n'Ubwongereza.

Iyi mfashanyigisho yateguwe kandi yandikwa mu rurimi rw'Ikinyarwanda hagamijwe ko uyisoma wese abasha kumva amahame shingiro yo kurinda umusaruro ndetse no kubungabunga ubwiza bwawo.

## 1.2 Amabwiriza n'imirongo ngenderwaho byifashishijwe

Ibisabwa ku buziranenge bw'ibiribwa, amabwiriza y'ubuhinzi bwa kijyambere n'uburyo bwo gucunga ubuziranenge muri iyi nyandiko byatanze ibitekerezo hashingiwe ku mabwiriza mpuzamahanga agenga ubuziranenge bw'ibiribwa asanzwe azwi yanditse mu ndimi z'amahanga harimo:

1. British Retail Consortium (BRC) issue 8;
2. Global Gap version 5.1;
3. Hazard Analysis Critical Control Point (HACCP) Codex Alimentarius;
4. HACCP RS 184:2017;
5. Food Safety Standard Certification (FSSC-22000);
6. Draft Rwanda Horticulture Code of Practice.

## IGICE CYA 2: URUGERO RW'UMUSHINGA WO KUNOZA UBURYO BWO KUBUNGABUNGA UMUSARURO

**Ingingo nkuru zibandwaho:** Abasomyi barakuramo ubumenyi n'ubuhanga ku mirimo ikorwa mu ruhererekane nyongeragaciro rw'imboga n'imbuto kugirango bamenye akamaro ko gucunga ibihombo ndetse n'inyungu iri mu kugabanya ibyo bihombi mu ruhererekanyongeragaciro rw'imateja.

### 2.1 Urugero rw'Umushinga wo kunoza uburyo bwo kubungabunga umusaruro

Hakenerwa ibintu byinshi haba igihe ndetse n'amafaranga mu buhinzi butanga umusaruro w'ibiribwa. Ubuhinzi bugamije isoko bukenera ibintu byinshi kereka nyine igihe umuhinzi ahinga agamije gusarura ibitunga umuryango we gusa. Muri ubu buhinzi bugamije isoko, umuhinzi agira uruhare mu bukungu bushingiye ku bucuruzi: Umuhinzi ashora mu bucuruzi kugirango abashe kugaruza ibyo yashoye hanyuma abone n'inyungu.

Ugereranyije, umusaruro w'ibintu bibisi wangirika mu bihugu bikiri mu nzira y'amajyambere biturutse kukutamenya kuwubungabunga neza, kubora ndetse no kwangizwa n'ibyonyi ugera kuri 40% by'umusaruro wose. Ibi bivuze ko kimwe cya kabiri cy'ibyejewe kitagera kuwo byahingwe wakagombye kubirya ndetse n'imbaraga zose zashyizwe mu kugirango biboneke zikaba zipfuye ubusa.

Mu Rwanda, abohereza imiteja mu mahanga bahura n'imbogamizi zitabarika bagarageza guhangana kureba uko igicuruzwa cyabo cyahangana ku isoko. Ikigereranyo cya 40% kugera kuri 45% cy'umusaruro gitakarira mu byiciro bitandukanye mu rusobe nyongeragaciro rw'imateja. Kugerageza kuramira umusaruro ku rwego urwarirwo rwose n'ubwo waba udakoresha ubuhinzi buteye imbere bigufasha gutuma umusaruro wawe ubasha guhangana ku isoko ugereranyije n'uko bimeze ubu. Ukurikije amakuru yatanze n'ubwohereza mu mahanga ndetse n'amakuru atangwa na NAEB, ugereranyije 50% by'umusaruro ugera ku isoko bigoranye. Ukurikije ubushakashatsi bwakozwe n'umuryango uharanira iterambere w'Abahorande (SNV) muri 2017, ibyangirika mu musaruro mu Rwanda biri mu byiciro bibiri, mu murima hatakara 12% mu gihe aho babika umusaruro hagaragara ibihombi biri kuri 20% kugera kuri 30% bigendanye n'igihe Sizeni y'isarura yabereye kuko mu gihe cy'imvura ibyangirika bigera no kuri 50% y'umusaruro wose.

Imbonerahamwe ya 1 iragaragaza impuzandengo y'ibihombi biboneka kuri buri cyiciro cy'uruhererekane nyongeragaciro, ubaze ibyo uba washoye byose nk'inyongeramusaruro, abakozi, amashanyarazi, ibintu bitandukanye uba wagiye ugura, kugirango ubashe kubona ikilo kimwe cy'imateja. Ukurikije aya makuru, biragoye ko abohereza imiteja mu mahanga babasha kubona inyungu mu gihe 40% by'umusaruro biba byoherejwe ku masoko asanzwe yo mu gihugu.

Imbonerahamwe ya 1 Impuzandengo y'ibihombi kuri buri cyiciro cy'uruhererekane nyongeragaciro

Icyiciro cy'uruhererekane nyongeragaciro	Ibitakara kuri ubu mu biro (Kg)	Ijanisha ry'ibitakara ubu (%)	Amafanga atakara mu madorari	Ibitakara nyuma go gukoresha Tekiniki zigezweho	Umusaruro uba ugaruje mu biro	Amafanga uba ugaruje mu madorari nyuma yo gukoresha Tekiniki zigezweho	Ikiguzi cy'ibyagurushijwe byo mu cyiciro cya 2 mu manyarwanda
Mu gusarura	100	10%	150	3%	70	105	10500
Mu bubiko bwo ku murima	20	2%	30	1%	20	30	4500
Mu kubitwara	60	6%	90	1%	50	75	7500
Aho bitunganyirizwa	350	35%	525	8%	270	405	40,500
Guhuza uburemere n'igihe bimara bitarangirika	60	6%	90	2%	40	60	6000

**Ibisobanuro:** twabaze ko Ikilo 1 kigura idorari 1.5 (1.5USD) ku isoko mu gihe Ikilo 1 cy'umugaruro wo mu cyiciro cya 2 ugura 150Frw ku nzu ibikwamo umugaruro inapakirirwamo ibyoherezwa hanze muri NAEB (Pack House)

Kugabanya umugaruro wangirika bisaba kubanza kumva neza impamvu n'imizi ituma uko kwangirika k'umugaruro kubaho kuri buri cyiciro cy'uruhererekane nyongeragaciro ukazikurikiranya kugirango ufashe Abashoramari bato n'abaciriritse gushyiraho ingamba zo kugabanya ibyo bihombwa kuri buri cyiciro.

## 2.2 Impamvu zitera gutakaza umugaruro

Imbuta n'imboga bigizwe ahanini n'amazi kuri 65-95%, bigomba rero kugumana ayo mazi nyuma yo gusarurwa mbese bigakomeza ubuzima nk'ubwo byarimo bikiri mu murima.

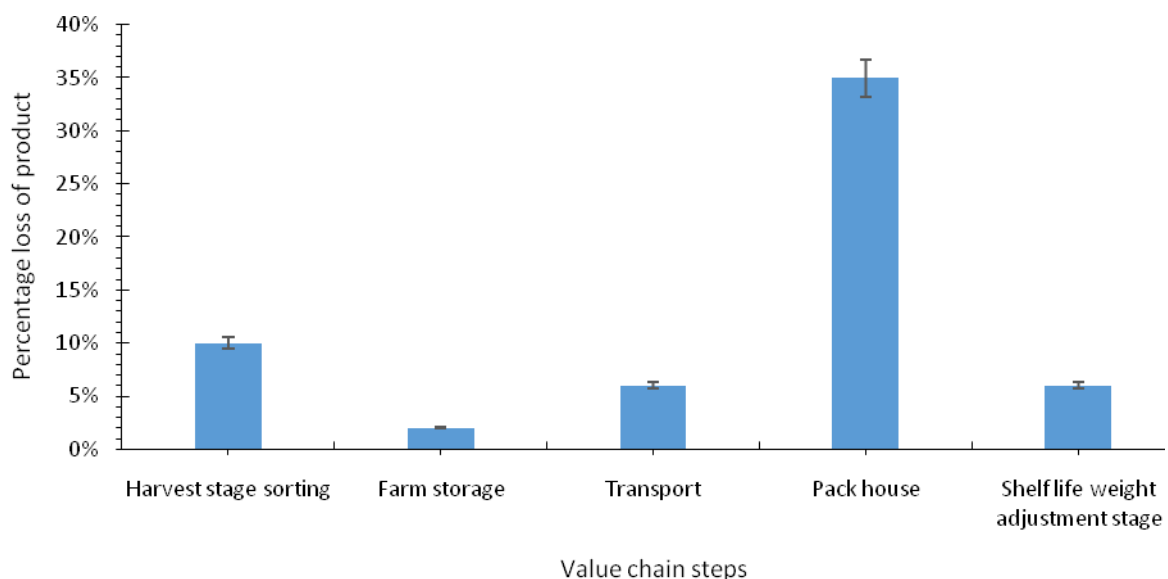
Igihe bishobora kumara bitari byangirika nyuma yo gusarurwa giterwa n'igipimo bikoreshamo ibiryo byibikiye n'igipimo bitakazamo amazi. Ukwangirika kw'ubwiza kugaragara iyo ibihingwa byamaze ibiryo byari byaribikiye. Hari ibikorwa byinshi bizamura iki gipimo cyo kwangirika kugeza aho igisarurwa kidashobora kuribwa.

Ishusho ya 1 iragaragaza ibitakara kuri buri cyiciro cy'uruhererekane nyongeragaciro. Muribyo, mu bubiko bw'imboga n'imbuta niho cyane habere gutakaza umugaruro kugera kuri 35% ahanini bitewe n'imirimo ihakorerwa yo gushyira mu byiciro no kujonjora aho ibidahuye n'ibyo abakiriya bakeneye bivanwa mu bindi bigacuruzwa ku isoko ry'imbere mu gihugu cyangwa bikaba ibiryo by'amatungo.

Hari ibirebwaho mu kwemeza ko igicuruzwa cyujuje bidasubirwaho ibisabwa ku isoko ry'ibihugu by'Iburayi no mu Bwongereza harimo ko igicuruzwa kigomba kuba kitararwaye cyangwa ngo cyangizwe n'ibyonnyi, kitarakomeretse, ibisigazwa by'imiti y'ubutabire yagisigayeho bikaba bitarengeje urugero rwihanganirwa kandi na none cyujuje uburambuke busabwa (hihanganirwa ibitarengeje 2% y'ukwikunje/ubwihine). Iyo ibi bisabwa byavuzwe haruguru byuzuye, inzu irobanurirwamo umugaruro ukanabikwamo mbere yo koherezwa mu mahanga (Pack house) iba ishobora kwakira gusa umugaruro wose uvuye mu mirima ufite hejuru ya 85% by'ibiri bwoherezwe mu mahanga kugirango hagabanywe mu buryo bugaragara ibijugunywa mu gihe cyo kurobanura no gushyira mu byiciro.

Icyakora, ibikunze kugaragara ni uko irobanura rikorerwa ku murima ridakunze kugera ku rugero rwihanganirwa, ibi bigatuma ku nzu ipakirirwamo ibijya mu mahanga haboneka byinshi bitujuje ibisabwa n'abakiriya.

Ishusho ya 1 Ibyiciro by'Uruhererekane nyongera gaciro n'ingano y'ibitakara



Irobanura rya mbere rikorerwa ku murima rivanamo umugaruro ugera ku kigereranyo cya 10% bikagenda biyongera ukurikije imyaka ya buri gipande cy'umurima (1% mu gipande cy'umurima gishya no hejuru ya

15% mu gipande cy'umurima gishaje), ibi rero akaba ari igihombo gikomeye. Kuri ubu, ba Rwiyemezamirimo bato n'abaciriritse bari muri ubu buhinzi bakunze guhura n'igihombo gituruka ku kwangizwa n'ibyonyi, gukomereka biterwa no gusarurira mu bikoresho bitujuje ubuziranenge (Urugero nk'imifuka).

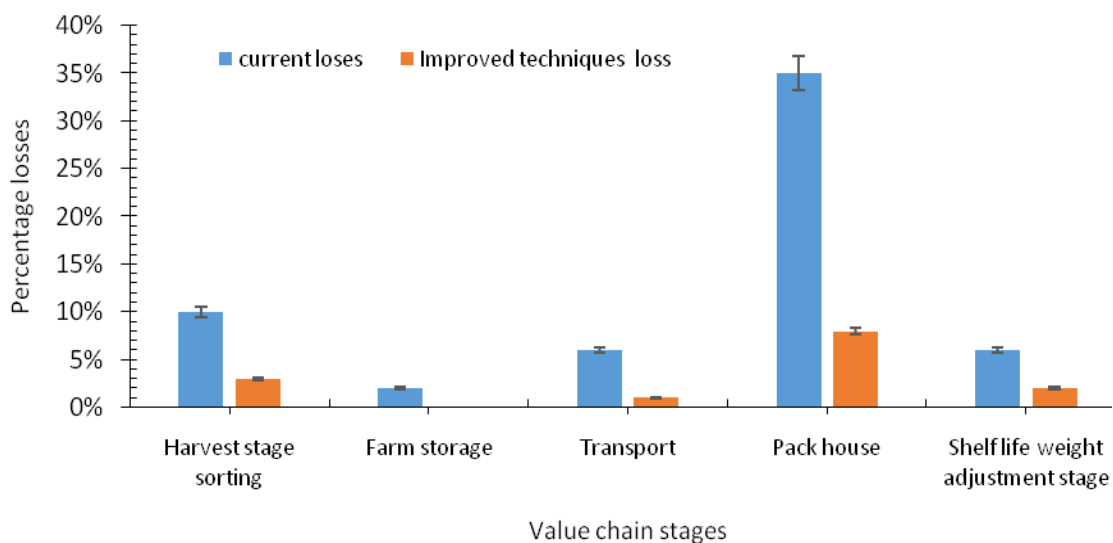
Ku mpuzandengo, ba rwiyemezamirimo bato n'abaciriritse bohereza umusaruro mu mahanga batazaza hagati ya 6% na 10% by'umusaruro mu gihe cyo kuwutwara bawukura ku murima bawuzana aho utunganyirizwa. Uko guhomba guturuka ahanini ku gutakaza amazi k'umusaruro bitewe no gukoresha uburyo bwo gutwara butuma umusaruro utakaza amazi mu gihe cyo kuwuvana mu murima no kuwugeza aho utunganyirizwa. Kubahiriza uburyo bwiza mpuzamahanga bwo gutwara umusaruro byagabanya icyo gihombo kuva kuri 10% bafite uyu munsu kikagera kuri 3% cyemewe. Gukoresha ibikoresho nk'iminzani yujuje ubuziranenge ku mirima byagira ingaruka nzira mu gutuma ibiro byapimiwe ku murima biba ari ibya nyabyo bityo bikagabanya ikinyuranyo cy'uburemere gikunze kwitirirwa ko ari igihombo.

### 2.2.1 Ihame ryo kubara igishoro n'ibyo ukuramo mu gukoresha uburyo bwa Tekiniki zigezweho ugamije kugabanya ibihombo

Abenshi muri ba rwiyemezamirimo bato n'abaciriritse bari mu bijyanye n'umusaruro w'imboga n'imbuto bacungira ku bahinzi bato, baba abahinzi ku giti cyabo cyangwa se abahinzi bibumbiye mu makoperative. Kubera icyo mpamvu, bake gusa muri aba ba Rwiyemezamirimo nibo bafite ubushobozi bwo kwikurira umusaruro mu mirima yabo. Kugabanya ibihombo n'iyangirika ry'umusaruro byaba uburyo bwiza ku bahinzi bwo kuzigama amafaranga mu gihe bizeye: Kwishyurirwa ku gihe n'ishoramari ryohereza mumahanga rihangana n'isoko, bigatuma banatunga abantu benshi mu miryango yabo. Gukurikira Tekiniki zigezweho bigamije gutuma abohereza mu mahanga bazigama amafaranga avuye mu musaruro watakaraga bakaba bayashora mu bikorwa binyuranye biteza imbere uru rwego binyuze mu:

- Kongera ibyo bajyana ku isoko ndetse n'ihangana ry'abohereza ibicuruzwa ku isoko ry'ibihugu by'umuryango w'ibihugu by'iburayi n'Ubwongereza;
- Gutera izamuka ry'abohereza mu mahanga binyuze mu kuzamura inyungu bakuramo;
- Gutanga akazi kenshi ndetse n'uburyo bwo kubona amafaranga bizamura ubukungu bw'icyaro;
- Guteza imbere ihame ry'uburinganire kuko abagore benshi baba babonye akazi mu mirimo yo gutunganya umusaruro ndetse no mu bikorwa byo kuwucuruza;
- Kuzamura ubushobozi bwo kugura ibikoresho bito bito biba bikenewe mu gushyira mu bikorwa tekiniki zigezweho, urugero nko kugura amakureti mu mwanya wo gukoresha imifuka basarura.

Ishusho ya 2 Igereranya ry'ibyo uzigama icyo ukoresheje Tekiniki zigezweho ugereranyije n'uburyo busanzwe bukoreshwa



Imbonerahamwe ya 2 Urugero rw'Igishoro n'inyungu iyo ukoresheje Tekinoloji zigezweho

Urwego rw'uruhererekane nyongeragaciro	Uko ibihombo bisanzwe bimeze	Ibiro bitakara (Kg)	Amadorari atakara (1.5USD/kg)	Uburyo bugezweho bwakoreshejwe	Igipimo gisabwa	Igiciro cya kimwe USD	Igishoro cyose (USD) Igishoro cy'uburyo bugezweho	Ibisobanuro
Mu gusarura	10%	100	150	-Gukoresha amakureti yemewe. -Kongera ubumenyi. -Utwuma tugenzura ubushyuhe -Irati yo gupimisha -Gutera ibiti bitangira umuyaga	63  Iminsi 2 1  5	3.9  200 22.99  4	246.5  400 22.99  20	Ibikoresho bya mbere yo gusarura
Mu bubiko bwo ku murima	2%	20	30	-Icyumba gikonjesha gikoresha amakara -Gukoresha shedineti	1 50m	NA 7.5	3000** 375	Shedineti ishobora gukoreshwa mu kugabanya ubukana bw'izuba kubyo wasaruye
Mu kubitwara	6%	60	90	-Imodoka ifite icyuma gikonjesha. -Gukodesha imoddoka ifite icyuma gikonjesha ibasha gutwara Toni 5 -Kongera ubumenyi.	1 1  Iminsi 2	NA 100  200	55,000* 100  400	Kugura imodoka birahenda cyane ukurikije ubushobozi abashoramari bahari uyu muni bafite, gukodesha nibwo buryo bwiza
Aho bitunganyirizwa	35%	350	525	Kongera ubumenyi.	Iminsi 2	200	400	Amahugurwa yo kongera ubumenyi azagabanya bidasubirwaho ibihombo ugendeye ku bisabwa gihingwa
Guhuza uburemere n'igihe bimara bitarangirika ukoresheje imifuka ya BOPP	6%	60	90	Gufunga mu mifuka ya MAP mu buryo bugezweho/Kongera ubumenyi	Iminsi 2 Hajyamo 2000	200 0.042	400 84	Kuvugurura uva ku gupakira mu mifuka ya BOPP ihumeka cyane ukajya ku mifuka ya MAP
Igiteranyo			885				5848.5	

Icyitonderwa \* Ikigereranyo cy'igishoro cy'igihe kirekire harimo n'uburyo bwo gukodesha mu makompanyi atanga ibikoresho, \*\* Ikigereranyo cy'igishoro kizamara hejuru y'imyaka 5.

Ibihombo by'amadorari 885 USD kuri Toni 1 y'imiteja, ku gishoro cy'amadorari 5146 bizasaba umusaruro ungana na Toni 10 kugirango nibura utangire kubona inyungu kubyo washoye (Ibindi bishoro bijyanye n'imirimu isanzwe, amafaranga ahoraho nay'inyongeramusaruro ntabwo yabazwe hano).



## 2.3 Guteza imbere uruhererekane nyongeragaciro

Ibikorwa byo mu ruhererekane nyongeragaciro rw'imateja yoherezwa mu Mahanga birimo kuyihinga ukabona umusaruro, kubungabunga umusaruro, Gutwara umusaruro ndetse no kuwukwirakwiza mu badandaza. Guhinga kugirango ubone umusaruro ni igikorwa cy'ingenzi muri uru ruhererekane nyongera gaciro ariho hazamo gushaka inyongeramusaruro (imbuto, ifumbire n'imiti) ukoreshaje amabwiriza yose yo kwita ku gihingwa.

Kumva neza uru ruhererekane nyongeragaciro ni ingenzi cyane ku bafatanyabikorwa kugirango bamenye ibibazo byose n'imbogamizi zituma habaho gutakaza no guhomba umusaruro muri urwo ruhererekane nyongeragaciro rwose. Ihame ryo Kugabanya ibyangirika n'ibihombo muri uru ruhererekane nyongeragaciro rufite ibice byinshi: Muri byo harimo, ibifite uruhare rutaziguye harimo:

- Gusesengura itakazwa ry'umusaruro mu ruhererekane nyongeragaciro kuri buri rwego hamwe n'abafatanyabikorwa bose bituma bamenya uruhare rwabo n'uburyo ibikorwa byabo bifite uruhare mu kubona umusaruro ufite ubuziranenge ndetse n'ubwiza bukwiye;
- Kongera ubushobozi mu ruhererekane nyongeragaciro rwose biciye mu kwinjizamo ikoranabuhanga ndetse no gukora ibindi bikorwa bidashingiye ku ikoranabuhanga aho buri wese agira aho ahurira n'icyo gihingwa yongererwa ubushobozi biciye mu mahugurwa, ibiganiro nyunguranabitekerezo, ingendoshuri ndetse no guhuzwa n'amasoko mu rwego rwo kumva neza icyo isoko risaba bityo bigatuma hubakwa ihiganwa ku isoko.
- Gukoresha ikoranabuhanga rigezweho biciye mu bushakashatsi no gushyira mu bikorwa imirongo iba yarashyizweho mu kugabanya ibihombo n'umusaruro utakara.

Urwego rw'ubuhinzi n'ubucuruzi bw'imateja ruragenda rugorana kurushaho bitewe n'inzego nyinshi z'abantu bamaze kurujyamo. Guhinga imiteja harimo ingingo zimwe z'ubuhinzi buteye imbere ndetse n'uburyo bwo kubungabunga umusaruro nk'uko bigaragara hano hasi:

### 2.3.1 Uburyo bukoresha mu buhinzi bw'imateja

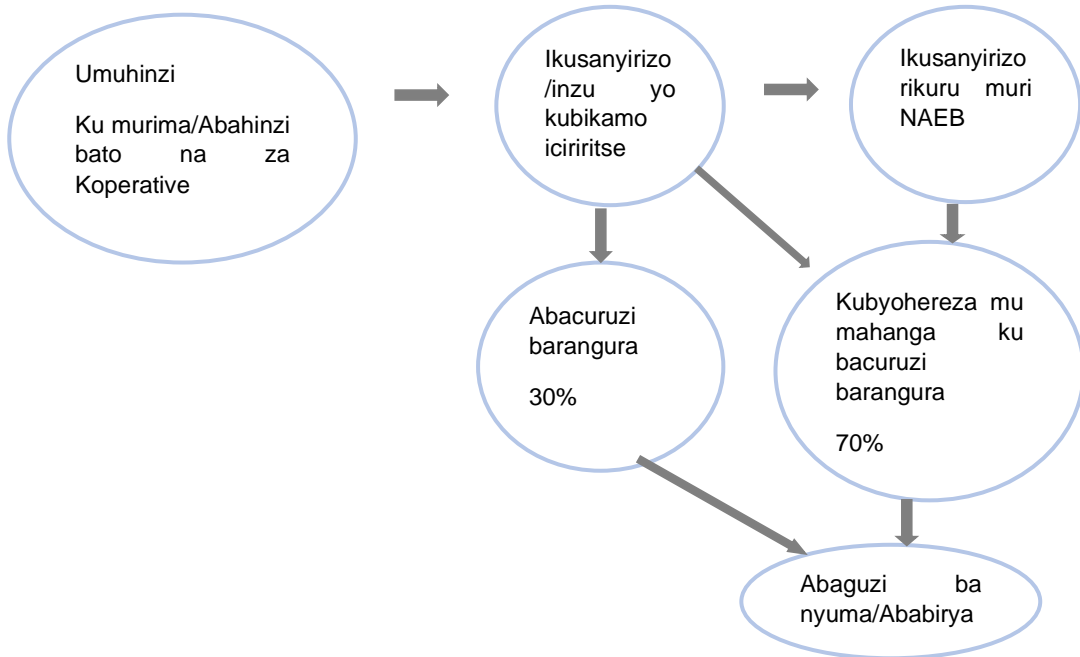
#### 2.3.1.1 Uburyo bwa gakondo

Uruhererekane nyongeragaciro rwa gakondo bushingiye ku mitekerereze y'umuhinzi wo mu cyaro mu bihugu bikiri mu nzira y'Amajyambere, aho bahahirana ubwoko butandukanye bw'imboga n'ibinyampeke ariko bareba cyane ku isoko ry'aho mu cyaro gusa (haba mu mazu acururizwamo cyangwa mu masoko manini). Uru ruhererekane rwa gakondo ruzwi nk'urugoranye aho abantu ibicuruzwa binyura mu ntoki ari benshi bigatuma n'igiciro cyabyo kizamuka.

#### 2.2.1.2 Uburyo buteye imbere

Uruhererekane nyongeragaciro ruteye imbere ruzanamo ubucuruzi bwambukiranya imipaka, rukagengwa n'ibikorwa by'ubucuruzi mpuzamahanga, ahanini biturutse ku kuba ikintu runaka gishakwa mu kindi gihugu. Ubuhinzi bw'imateja mu Rwanda ahanini bushingiye ku kohereza umusaruro hakurya y'umugabane wacu aho bugengwa cyane n'ibyo abaguzi baba bifuzwa, bukaba buzana inyungu nyinshi ugereranyije n'ubwambukiranya imipaka gusa, na none kandi akaba aribwo bukorwa muri gahunda nziza ugereranyije n'ubuhinzi bwa gakondo. Imiteja igwa neza cyane mucyo twita "Uruhererekane nyongeragaciro rugezweho"

Ishusho ya 3 Uruhererekane nyongeragaciro rw’Imiteja ruteye imbere



Abahinzi b’iki gihingwa ahanini bagirana amasezerano n’Abohereza umusaruro mu mahanga, aho uwohereza mu mahanga aba yemeye ko azagura umusaruro w’imiteja ku giciro runaka cyemejwe muri ayo masezerano. Umusaruro uvuye mu murima ushobora kurobanurirwa ku ikusanyirizo riwegereye hanyuma ughita woherezwa ku kibuga cy’indege uhita ujya mu Burayi cyangwa se ukabanza guca mu ikusanyirizo rikuru ryo muri NAEB (Rikoreshwa na benshi) kugirango ukonjeshwe, urobanurwe, ushyirwe mu byiciro, wongere ukonjeshwe hanyuma upakirwe ujanwa mu ndege kugirango woherezwe mu bice bitandukanye (Mu bihugu bigize Umuryango w’ibihugu by’iburayi, Ubwongereza no mu Bihugu byunze ubumwe by’Abarabu).

Ubuziranenge bwo ku rwego rwo hejuru ndetse n’isuku ihagije ni ihame mu kurinda ko hazamo ikintu cyashyira ubuzima mu kaga, byaturuka kuri mikorobe, ikintu gifatika cyivanzemo, icyatera guhumana, ikinyabutabire, kugirango ibyo byokurya bibe byujuje ubwiza busabwa.

Mu ruhererekane nyongeragaciro rw’Imiteja ruteye imbere, biba byitezwe ko uwohereza mu mahanga atagira undi muntu umuhuza n’uwo yohereza ibicuruzwa, ni ukuvuga ko uwohereza mu mahanga aba afite ubushobozi bwo guhinga akabona umusaruro, akawupakira, akawohereza mu mahanga hanyuma akaranguza ibicuruzwa bye mu masoko cyangwa ku bandi barangura hatagize abandi bantu bo mu biguhu yoherejemo ibicuruzwa bye bazamo hagati.

*2.2.3 Uruhererekane nyongeragaciro ku musaruro w’imiteja n’ibihombo bigenda biboneka kuri buri rwego rw’urwo ruhererekane*

Kubungabunga umusaruro w’imiteja bisaba ibikorwa byinshi bitangirira mu murima mbere yo gusarura, kuyibika ku murima, kuyitwara ujya ku ikusanyirizo, kuyikonjesha bwa mbere, kuyitoranya, kuyishyira mu byiciro, kuyikonjesha hanyuma ukayohereza mu ndege. Iyi mirimo yose igomba gukorerwa mu byumba bikonjesha bicunzwe neza ku rwego rwo hejuru kugirango ugabanye ibyangirika cyangwa ibihombo by’umusaruro.

**Igihe cyo gusarura**

Ibibera mu murima mbere yo gusarura byihariye 10% y’ibihombo by’umusaruro mu gihe cyose imiteja imara. Impamvu zimwe ziterwa no kwangirika guturuka ku byonnyi n’indwara ndetse n’ihindagurika ry’ibihe nk’imvura nyinshi itera imyuzure, cyane cyane iyo abahinzi bahinze mu bishanga. Ikindi gitera ibihombo ku musaruro mbere yo gusarura ni ihutazwa riterwa n’umuyaga udasanze uhuha ku muvuduko wo hejuru usiga ibara. Ibi ushobora kubwirinda utera ibiti bitangira umuyanga ku nkengero z’umurima (kuko umuyaga umenera mu bihingwa). Ibihombo by’umusaruro bigendana n’ubukure bw’igihingwa kubera ko iyo kikiri gitoya, ibijugunywa biba bikiri hasi kuri 1% y’ibyasarurwe byose. Ariko uko igice cy’umurima kigenda gikura,

igihombo cy'umugaruro kirazamuka kikagera kuri 15% nk'iy igipande cy'umurima gisarawe ku nshuro ya 16, ibi nibyo bitanga impuzandengo y'igihombo cya 10% ukurikije ibigaragara mu irobanura rikorerwa ku murima.

### **Kubika umugaruro by'agateganyo ku murima**

Uko ubika umugaruro by'agateganyo ku murima ni ingenzi cyane mu ruhererekane nyongeragaciro. Iyo bikozwe nabi bituma umugaruro uhura n'ibiwangiza bitandukanye ndetse ubwiza bw'imiteja bukangirika byihuse. Kubika umugaruro ku bushyuhe bw'inshi bituma imiteja itakaza amazi (igatakaza n'ibiro), ibyo bigatuma ugira ibihombo.

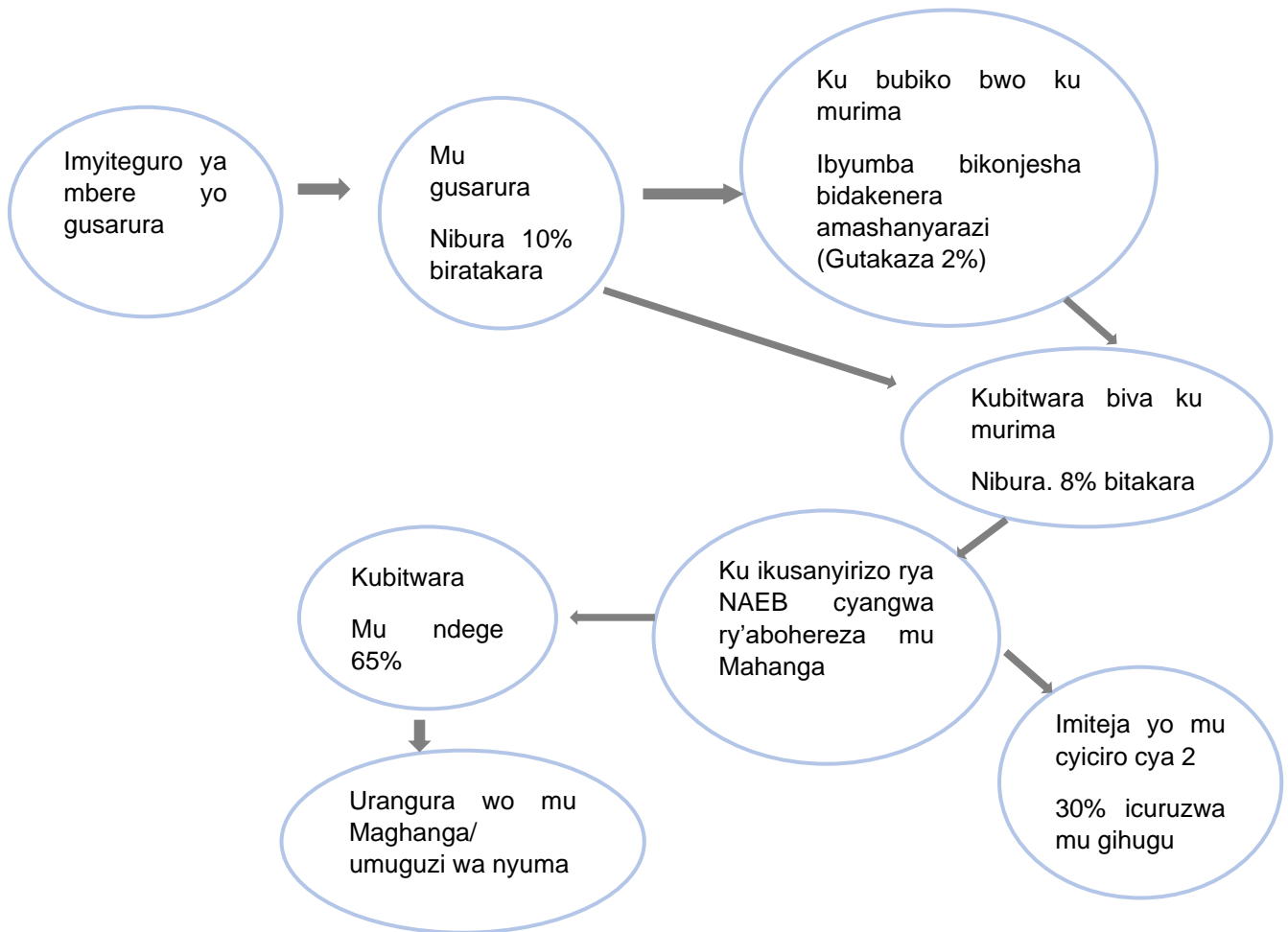
### **Gutwara umugaruro hagati mu mirima**

Kuberako abenshi mu bohereza imiteja hanze bakura umugaruro mu bahinzi bato baba baragiranye amasezerano yo kubahingira bakabagurira umugaruro, abo bahinzi baba batatanye hirya no hino mu Rwanda, ibi bigatera ikibazo gikomeye mu gukusanya uwo mugaruro mbere yo kuwutwara ujanwa aho utoranyirizwa. Uburyo bwatwaramo kuri ubu butera iyangirika ry'umugaruro kugera ku mpuzandengo ya 6%. Ibihombo biterwa ahaninini ku gutwara uwo mugaruro mu modoka zidafite uburyo bwo gucunga ubushyuhe, imodoka zidatwikiriye zituma hazamo umwanda (ivumbi) mu mugaruro, imihanda irimo ibinogo hagati y'umurima n'ikusanyirizo byongera uko kwangirika.

### **Ku ikusanyirizo rikuru**

Kuri ubu, ibihombo bibonekera ku ikusanyirizo rikuru bitera gutakaza hagati ya 35 na 40% by'umugaruro wose uba wagejwe muri NAEB (Imibare yo mu ikusanyirizo rikuru rya NAEB). Iki gihombo cyo ku rwego rwo hejuru gituruka ku mpamvu zitandukanye harimo nko kuba bazana umugaruro udahuye n'ibyo isoko risaba (Imiteja y'ubunini burenze ubusabwa), Imiteja ifite ukwiheta kurengeje ukwihanganirwa, imiteja yatakaje amazi, iyangijwe n'indwara n'ibyonnyi nk'ikimenyetso cy'uko ititaweho mu murima. Inzu itunganyirizwamo ibyoherezwa mu mahanga ubwayo iri mu bitera ukwagirika kw'umugaruro kubera uko yubatswe (ni ukuvuga kutagira ibigabanya ubushyuhe mu gice gitunganyirizwamo imiteja). Kugabanya ibyangirika mu nzu itunganyiriza ibyoherezwa mu mahanga bisaba gukoresha tekinike zigezweho ku rwego rw'umurima nko kongera ibikorwa remezo. Ibi birasaba gushyiraho uburyo bwo gukonjesha ku mirima, kurinda ko ibyasarawe bikubitwa n'izuba no gukoresha ibikoresho bisarurirwamo byujuje ibisabwa.

Ishusho ya 4 Iikorwa rusange bikorwa mu ruhererekane nyongeragaciro rw'imateja (ikigereranyo cy'ibihombo cyabazwe hashingiwe ku mibare yavuye mu nzu itunganyirizwamo umusaruro muri NAEB)



## 2.4 Ibisabwa n'isoko

Ibikorwa byo kohereza ibicuruzwa mu mahanga bigengwa n'amasezerano mpuzamahanga, hagati y'impande ebyiri cyangwa nyinshi, ibihugu biba byaragiranye hagati yabyo cyangwa hagati y'ibice runaka bikajyana n'amategeko ya buri Gihugu ibintu byoherezwamo kuri buri gicuruzwa. Umusaruro mwinshi uva mu Rwanda woherezwa mu Bihugu bigize umuryango w'ubumwe bw'ibihugu by'Iburayi no mu Bwongereza, kubera iyo mpamvu, ahohereza ibyo bicuruzwa mu mahanga bagomba kubahiriza ibisabwa n'amategeko y'Umuryango w'ibihugu by'Uburayi n'Ubwongereza. Ibyo bisabwa bisa nk'aho bifatwa nk'ibisaba ibintu byinshi kugirango ubishyire mu bikorwa ku bohereza mu mahanga badafite ubufasha buva hanze.

Ibisabwa n'isoko bigabanyijemo ibirebana n'amategeko, ibirebana n'ubucuruzi n'ibirebana n'imibereho myiza. Ikigambiriwe nyamukuru ni ukwizera ko bohererejwe ibicuruzwa bifite ubuziranenge, ubwiza kandi byakorewe ahantu bitangije ibidukikije, mu gihe kandi biba bitanga icyizere cy'ubuzima bwiza ku bakozi bafashije mu kubibona.

### Ibisabwa ku buziranenge bw'ibiribwa

Aya ni amabwiriza arebana n'ikoreshwa ry'imiti itemewe n'amabwiriza arebana n'ibisigazwa by'imiti irwanya ibyonnyi byemewe bihingwa (Ibisigazwa ntarengwa byemewe ku kuboneka ku musaruro w'ibiribwa (MRLs)), ariko mu gihe ibyo bisigazwa byaba bigaragara ku rugero rurenze urwihanganirwa mu kiribwa mu gihe cyo kugipima, bikaba byatera uwabirya ibibazo. Gusanga mikorobe itera indwara mu gicuruzwa kiribwa ni ikintu kibaraje ishingira cyane. Kubera iyo mpamvu, hari ibyitonderwa biba byarashyizweho kugirango ubashe kugirango ugeze ku isoko ibyujije ibisabwa.

### **Ibirebana n'ubwiza bisabwa ku bicuruzwa**

Ibirebana n'ubwiza busabwa biba bifitanye isano n'imiterere y'ibyo isoko rikeneye kandi iryo soko niryo ribishyiraho. Amasoko y'imateja ari mu byiciro 3 kandi buri cyiciro kigira igiciro cyacyo gitandukanye n'ikindi.

### **Kubahiriza ibirebana n'imibereho myiza y'abaturage, kurengera ibidukikije n'ubucuruzi**

Iyoherezwa mu mahanga ry'ibiribwa bibisi mu muryango w'ibihugu by'Uburayi no mu Bwongereza bisaba ko ibyo wohereza biba byujuje ibisabwa birebana n'imibereho myiza y'abaturage no kurengera ibidukikije, n'ubwo ibyinshi mu bisabwa bijyane n'imibereho myiza y'abaturage no kurengera ibidukikije bishingiye kubyo wuzuzwa ku bushake, nk'ubucuruzi magirirane (Fair Trade), gahunda yo kubaha uburenganzira bw'abakozi (Ethical Trade Initiative (ETI)), icyemezo kijyanye no kubahiriza isuku (Good Hygiene Practices (GHP)) n'icyemezo cy'uko wubahiriza kurengera ibidukikije (Rainforest Alliance) bizana amafaranga y'inyongera ku giciro gisanzwe iyo ufite ibi byangombwa kurenza ibicuruzwa bitagifite. Bamwe mu baguzi baha agaciro aboherereza ibicuruzwa bashingiye kuri ibi byangombwa bitangwa hashingiwe ku mabwiriza yo kubahiriza imibereho myiza y'abaturage no kurengera ibidukikije mbere yo kwemeza umuntu mushya uzajya amwoherereza ibicuruzwa.

### **Ibisabwa ku buzima bwiza bw'igihingwa**

Buri musaruro ukomoka ku buhinzi woherezwa mu Bihugu bigize Umuryango w'Ubumwe bw'ibihugu by'Uburayi usabwa kuba wubahirije amabwiriza y'uwo muryango arebana n'ubuzima bw'igihingwa, harimo kwemeza biciye mu cyangombwa cy'ubuziranenge bw'igihingwa (Phytosanitary Certificate) cyemeza ubuziranenge bw'icyo gihingwa cyenda koherezwa mu bihugu bigize uwo muryango kandi ko kitakwangiza na gato, hakaba hataranashyizwemo utundi tunyabuzima twatera ikibazo ku muntu.

Ibisabwa n'abaguzi ndetse n'amategeko y'aho ugurisha bigarukwaho mu gice cya gatatu n'icya kane by'iyi nyandiko.

## IGICE CYA 3: UBUZIRANENGE BW'IBIRIBWA NO GUKURIKIZA UBUHINZI BWA KIYAMBERE MU KUBUNGABUNGA UMUSARURO

**Ingingo nkuru zo kwitaho:** Gufasha ukoresha iyi nyandiko kumva neza ubuziranenge bw'ibiribwa busabwa mu rwego rw'ubuhinzi n'akamaro kw'ubwiza bw'Umusaruro mu buhinzi bw'imiteja. Iratanga kandi umurongo ku gaciro k'igishoro n'inyungu iva mu gushora imari muri gahunda yo kubungabunga ubuziranenge bw'ibiribwa.

### 3.1 Ubuziranenge bw'ibiribwa n'amabwiriza y'ubuhinzi bwa kijyambere mu kubungabunga umusaruro

Gucunga neza umusaruro mu gihe cyo guhinga haba mbere yo gusarura na nyuma yo gusarura niryo zingiro ryo kubona ibiribwa byujuje ubuziranenge kandi byuje ubwiza mu nzira yose y'uruhererekane nyongeragaciro.

**Ubuziranenge bw'ibiribwa ni** nk'icyizere ugirira ibiribwa mu gihe byateguwe cyangwa se bikaribwa hakurikijwe icyo byagenewe, gituma ubiriye bidashobora kumugiraho ingaruka iyo ariyo yose mu mubiri (FAO, WHO 1997)

Ubuziranenge bw'ibiribwa ni itegeko ku bantu bose bafite aho baturira n'ibiribwa: Abahinzi, abatanga umusaruro, abawutunganya, abawikorera, abawohereza mu mahanga n'abawukura mu mahanga n'abandi bose bafite uruhare muri urwo rusobe nyongeragaciro. Inshingano ku buziranenge bw'ibiribwa n'ubwiza bwabyo mu rusobe nyonyeragaciro rwa buri kiribwa zigomba gusaranganywa kugirango ikiribwa gishyizwe ku isoko kibe cyujuje ibyo ibisabwa ngo kibe ari nta makemwa harimo:

- Kuba ikiribwa kitarimo ikintu icyo aricyo cyose cyakwangiza ubuzima bw'uwakirya;
- Ikiribwa cyubahirije amabwiriza n'ibisabwa bigenderwaho ubu;
- Ikiribwa gifite inenge kigomba kuvanwamo mu buryo bworoshye biciye mu kugihamagaza cyangwa kukigarura mu gihe cyose bigaragaye ko gifite inenge.

Mu rwego rwo kugabanya ibibazo ndetse no kongera amasoko, ibikorwa by'ubuhinzi busaba uburyo bwo kurwanya impanuka, kongera ubushobozi ndetse no guha icyizere abaguzi ko ibicuruzwa byawe ari nta makemwa.

Mu bucuruzi bwambukiranya imigabane, abaguzi n'isoko ubwaryo nibyo bigena amabwiriza akurikizwa kugirango ugere kuri iryo soko. Ayo mabwiriza muri rusange yifashisha ku mabwiriza yihariye ariho. Urugero ni uko amaduka acuruza mu bihugu by'Umuryango w'Ubumwe bw'ibihugu by'Uburayi ahitamo gukorana n'umuntu usanzwe ufite ibyemezo bihabwa n'uwakurikije amabwiriza ya BRC, Global GAP cyangwa GFSI, bitanga icyizere ko ibiribwa by'umucuruzi runaka byujuje ibisabwa ku kugirango bihabwe icyemezo cy'ubuziranenge bw'ibiribwa. Mu gihe amwe mu masoko adaha agaciro cyane kuba ubibohereje asanzwe afite bya byangombwa bishakwa ku bushake, abaguzi b'imbutu n'imboga bo mu Muryango w'Ibihugu by'Uburayi n'Ubwongereza bita cyane ku kuba ubohereza ibicuruzwa asanwe ari muri gahunda y'ibyo byemezo .

Ibyinshi muri ibibyemezo bifasha mu bucuruzi bishakwa ku bushake bisaba amafaranga kugirango ushyireho ibikorwa remezo bikenewe, wongerere ubumenyi abakozi binuze mu mahugurwa ndetse n'ubujyanama ndetse n'amafaranga y'inyongera yo kwishyura ibigo bitanga ibi byangombwa (Certificates) bimaze gukora igenzura. Ubwo bushobozi bw'amafaranga rero ntibyoroshye ko ba Rwiyemezamirimo bato n'abaziriritse babubona na none kandi icyo gishoro cy'inyongera gishobora gutuma ibicuruzwa byabo bitabasha guhangana ku isoko. Ariko na none ku rundi ruhande, amaduka yo mu bihugu bigize Umuryango w'Ibihugu by'Uburayi n'Ubwongereza bo basaba ibyo byemezo bishyura amafaranga y'inyongera ku giciro gisanzwe ku babohereza ibicuruzwa bifite ibyo byemezo bikanatanga icyizere cy'isoko rirambye ku bw'ibyo inyungu wavana mu kujya gushyira mu bikorwa amabwiriza y'ubuziranenge bw'ibiribwa ikaruta kure igishoro uba washyizemo ubijyamo.

### 3.1.1.1 Imirongo ngenderwaho mu buziranenge bw'ibiribwa n'itego ku rwego rw'umurima

Imirongo ngenderwaho y'ubuziranenge bw'ibiribwa mu murima ni inyandiko igaragaza mu buryo busobanutse neza ukwiyemeza k'umuhinzi ko amabwiriza y'ubuziranenge bw'ibiribwa yubahirijwe kandi agashyirwa mu bikorwa mu gihe cyose igihingwa cyari muri uwo murima.

Bimwe mu bintu by'ingenzi bisabwa mu mirongo migari igenga ubuziranenge bw'ibiribwa harimo gushyiraho itego z'ukuri mu gihe runaka (wagenzura) ukagena igihe zizaba zagezweho, zibarika kandi zoroshye. Imirongo ngenderwaho mu buziranenge bw'ibiribwa igomba gushyirwaho umukono n'Umuyobozi Mukuru w'umurima cyangwa urundi rwego rwiyejeje kuzashyira mu bikorwa ibyo gahunda y'ubuziranenge bw'ibiribwa isaba.

Ku rwego cyangwa sosiyete ifie amatsinda menshi afite uko yubatse ayishamikiyeho cyangwa se amakoperative afite icyemezo cy'imiyoborere inoze (QMS) (Uburyo bwa 2 muri Global Gap) bashobora kugira urwego rumwe rufata inshingano mu izina ry'amatsinda yose rukiyemeza gushyira umukono ku nyandiko imwe ibareba bose ku rwego rw'imiyoborere inoze (QMS)

## 3.2 Isesengura ry'ingorane n'inzezo zo kwibandaho mu kuzigenzura ku rwego rw'umurima- Gusesengura ingorane, Kuvumbura akaga no kukarwanya

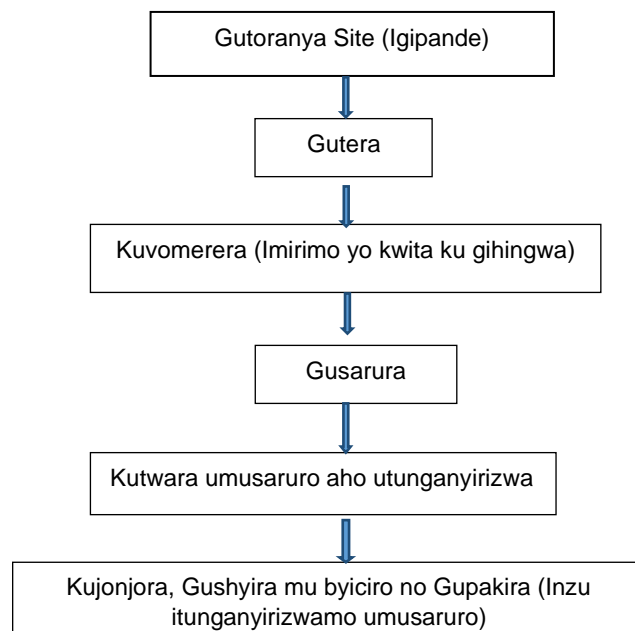
Ubuziranenge bw'ibiribwa bukora neza mu gihe iryo hame ryinjijwe muri buri sosiyete iri mu itunganywa ry'umusaruro w'ibiribwa. Porogaramu y'umuryango w'abibumbye yitwa "Codex Alimentarius" yemera Isesengura ry'impanuka n'inzezo zo kwibandaho mu kuzigenzura (HACCP) nk'ishingiro by'ibikenerwa by'ibanze.

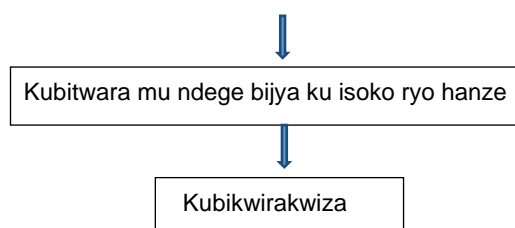
Ishusho y'uko igicuruzwa giherekanywa isobanura ibibera kuri buri rwego, uhereye mu murima ukagera aho kigurishirizwa bwanyuma. Isesengura rirambuye ry'ibikorwa kuri buri rwego ku birebana n'iherekanywa ry'igicuruzwa niyo ntambwe ya mbere y'iterambere ry'ihame ry'ubuziranenge bw'ibiribwa rirambye.

Igishushanyo cy'iherekanya ry'imiteja (Ishusho ya 3.1) ni igikoresho nyamukuru ku buziranenge bw'ibiribwa. Gikoreshwa mu gusuzuma ingorane n'akaga kuri buri rwego, aho ibikorwa byo kubirwanya bikenewe, kimwe no kwerekana ahantu hakomeye ugomba kwitaho mu kubirwanya.

Kumenya ibishobora kuba impanuka cyangwa akaga bigomba gukorwa kuri buri rwego aho ikiribwa kinyura, Ingamba zigafatwa mu rwego rwo kwirinda izo mpanuka ngo zitaba cyangwa guhangana nazo igihe zabaye.

Ishusho ya 5 Inzira y'iherekanywa ry'imiteja





### 3.2.1 Akaga kaboneka mu nzira imiteja inyuramo kari mu buryo butatu

#### Akaga gatewe n'ibintu bikorwaho/Bifatika

Nk'amabuye, Ibirahuri, Imisatsi, ibintu by'imirimbo byambarwa, ibitaka (Ibyondo).

Ibi ni ibintu bituruka hanze y'imateja ariko bitera ingorane cyane ku buzima cyangwa bigatera gukomereka guhoraho mu gihe cyose umuntu abiriye bikangiza munda cyangwa amenyo. Akenshi mu kaga gaterwa n'ibi ibintu bifatika gaterwa no kudakurikiza amabwiriza mu gusarura, mu kujonjora, mu gushyira mu byiciro no mu gupakira (FAO 1998). Gahunda yo gushyiraho ibyitonderwa yafasha kurinda ko ibi bintu byinjira mu biribwa mu gihe cyo gusarura, gutunganya umusaruro no kuwugeza ku isoko.

#### Akaga gaterwa n'ibinyabutabire

Ibitera akaga bituruka ku binyabutabire bishobora kuba bisanzwe biri mu kiribwa cyangwa se byaratewe mu kiribwa mu gihe cyo gusarura, nyuma yo gusarura, mu gutwara umusaruro cyangwa mu kuwukwirakwiza mu baguzi. Guhura n'ibi binyabutabire bitera akaga bihuzwa n'uko ari uburozi bukomeye butera ibibazo mu mubiri kubaburiye nyuma y'igihe kirekire (Ingaruka ntabwo ziba ako kanya).

Bimwe mu bintu bigera ku rwego rw'uburozi harimo: Imiti iri ku rwego rurengeje urwihanganirwa, amafumbire, uburozi, ibyuma biremereye, amavuta na Girise.

#### Akaga gaterwa na Mikorobe

Ibitera akaga mu biribwa bituruka ku tunyabuzima duto bishobora kuba bagiteri, uduhumyo cyangwa inzoka ubwazo. Uduhumyo tumwe dutera uburozi mu biribwa (Urugero ni nk'utwo bita "*Aspergillus niger*") dutera *afaratogisini*, "zearalenone", "fumonisins", "patulin", "ochratoxins A" n'ibindi.

Tugendeye ku mitere y'ikirere cyegereye umurongo ugabanya isi mo kabiri duherereyemo, utunyabuzima duto turiho ariko mu buryo uko twangiza ibiribwa ari nk'impanuka cyangwa se tukaba twari turi mu tunyabuzima twashyizwe mu butaka ngo butange umusaruro, dusanzwe mu ivumbi cyangwa ahandi hegereye aho. Mu bihe bimwe na bimwe, utwo tunyabuzima duto tugera ku kiribwa kiri mu murima ariko uburyo bwo kwita ku gihingwa butakoreshejwe neza nko mu gushyiraho ifumbire, gukoresha amazi yanduye mu kuvomerera, no mu kutubahiriza isuku mu gihe cyo kwita ku musaruro nyuma yo gusarura.

Zimwe muri Bagiteri zitera indwara zo kwitwararika zakwangiza ubuziranenge bw'imateja harimo:

Imbonerahamwe ya 3 Bagiteri zitera indwara zikunze kugaragara mu miteja

Ingorane izanwa n'Utunyabuzima duto dutera indwara	Ingaruka ku buzima
Escherichia coli (EHEC strain -Pathogenic strain)	Uburwayi bwo mu mara no mu gifu
Shigella spp	Impiswi ivanzemo n'amaraso
Streptococcus aureus	Uburwayi bwo mu bihaha
Listeria monocytogenesis	Uburwayi bwa "Listeriosi"
Clostridium perfringens	Impiswi/Kubabara mu gifu
Campylobacter species	Isesemi, Impiswi irimo amaraso n'umuriro
Salmonella spp	Isereri, Umuriro, kutabasha kwituma, ikizibakanwa
Vibro spp	Kubabara munda, kuruka, Guhitwa



Imbonerahamwe ya 4 Akaga gaterwa n'ibintu bifatika

Igitera akaga	Ingorane zishobora kubaho	Ikibitera	Uburyo bwo kubirwanya bukunze gukoreshwa
<b>Ibintu bikorwaho:</b>			
Umukozi	<ul style="list-style-type: none"> <li>- Ibintu by'imirimbo yambarwa</li> <li>- Bande</li> <li>- Umusatsi</li> <li>- Ibisigwa ku nzara</li> <li>- Utumanyu tw'urwara</li> <li>- Imigozi</li> <li>- Ibisigazwa by'itabi</li> </ul>	<ul style="list-style-type: none"> <li>- Kutagenzura abakozi basarura</li> <li>- Kudakora ubukangurambaga mu bakozi bakora imirimo yo gusarura</li> <li>- Gukoresha imyambaro y'ubwirinzi ku bakozi idakwiriye cyangwa kutayikoresha na gato</li> </ul>	<ul style="list-style-type: none"> <li>- Guhugura abakozi ku isuku n'isukura;</li> <li>- Gutanga udukoresho tw'ubwirinzi (PPEs) ku bakzi basarura;</li> <li>- Umukoresha agomba kugenzura isuku mbere yo gusarura;</li> <li>- Gushyiraho ibirango bya kirazira ku murima n'ahandi.</li> </ul>
Ibikoresho n'ibyo basaruriramo	<ul style="list-style-type: none"> <li>- icyuma</li> <li>- lkureti</li> <li>- igitu</li> <li>- Ikirahuri</li> <li>- Parasitike</li> <li>- icyuma</li> </ul>	<ul style="list-style-type: none"> <li>- Kudasukura icyuma bihagije;</li> <li>- Kutagenzura no kudakuramo amakureti yangiritse;</li> <li>- Uburyo budahwitse bwo gusana ibyangiritse;</li> <li>- Kujugunya ibirahuri na palasitike mu murima.</li> </ul>	<ul style="list-style-type: none"> <li>- Gushyiraho uburyo bwo gukora isuku no kugenzura uko bukorwa;</li> <li>- Kugenzura no gusana ibikoresho mbere yo kujya kubisaruriramo</li> </ul>
Umutaka	<ul style="list-style-type: none"> <li>- Ubutaka</li> <li>- Ibimene by'utubuye mu musaruro warangije gutegurwa</li> </ul>	<ul style="list-style-type: none"> <li>- Gusarura imiteja imvura ikimara kugwa cyangwa mu gitondo kare;</li> <li>- Gutwara imiteja mu modoka idatwikiriye.</li> </ul>	<ul style="list-style-type: none"> <li>- Koza imiteja n'amazi meza hamwe na Kororine;</li> <li>- Ntugasarure mu mvura, tegereza amazi yatonze ku miteja abanze yumuke</li> <li>- Koresha imodoka itwikiriye mu gutwara umusaruro.</li> </ul>
Amamashini	<ul style="list-style-type: none"> <li>- Ubutaka</li> <li>- Amabuye</li> <li>- Ibyuma</li> </ul>	Ibikoresho byanduye	Gushyiraho ingengabihe yo koza ibikoresho.

Imbonerahamwe ya 5 Ingorane zituruka ku binyabutabire

Igitera ingorane	Ingorane iboneka	Ikibitera	Uburyo bwo kubirwanya bukunze gukoreshwa
<b>Ingorane ziterwa n'ibinyabutabire</b>			
Ibyica mikorobe	Gukoresha isabune cyangwa ibindi bivanaho umwanda bihumura	Kutagira ubumenyi buhagije ku miti ivanaho umwana n'amasabune bikwiriye gukoreshwa	Gukoresha gusa ibinyabutabire byemewe na MSDS igaragaza ubwoko bwayo n'aho yemewe gukoreshwa
Imiti irwanya ibyonnyi	Iyo wariyeje urugero rwihanganirwa kuboneka mu kiribwa	- Gukoresha nabi imiti	Kurikiza amabwiriza y'Umuryango w'ibihugu by'Uburayi n'amabwiriza yo mu gihugu

	Gukoresha imiti yaciwe cyangwa kurenza urugero rw'ibisigazwa by'imiti byihanganirwa	<ul style="list-style-type: none"> <li>- Kutahitamo neza umuti ukwiye;</li> <li>- Kutagenzura neza igihe ugomba gusiga hagati yo gutera umuti no gusarura nk'uko biba byanditse ku kirango cyumuti;</li> <li>- Gutera umuti mu muyaga mwinshi;</li> <li>- Kudakoresha urugero rw'umuti rwemewe;</li> <li>- Gutereshya umuti igikoresho kitameze neza;</li> <li>- Gukoresha amazi yanduye mu gihe cyo gutera umuti.</li> </ul>	<ul style="list-style-type: none"> <li>- Gukora urutonde rwemewe kuri buri gihingwa;</li> <li>- Gukurikira intera igomba kuba hagati yo gutera umuti no gusarura nk'uko biba biri ku kirango cy'umuti;</li> <li>- Guha amahugurwa yo gutera umuti ikipe ibishinzwe;</li> <li>- Gusiga umwanya ukikije buri gice cy'umurima;</li> <li>- Kureba neza igihe gikwiye cyo gutera umuti;</li> <li>- Kuregera neza ibikoresho byo gutera umuti.</li> </ul>
Girise n'amavuta	Ibizinga by'amavuta na girise	<ul style="list-style-type: none"> <li>- Gutwara amavuta mu bintu usanzwe utwaramo umusaruro;</li> <li>- Kunyanyagiza amavuta ku mbuga mu gihe uri kuhashyira n'umusaruro.</li> </ul>	<ul style="list-style-type: none"> <li>- Kudakoresha ibikoresho byagenewe gusarura indi mirimo;</li> <li>- Kubika neza ibintu birimo ibinyabutabire;</li> <li>- Gusana ku gihe ibikoresho bikoreshe mu murima.</li> </ul>
Ibinyabutabire byo mu bwoko bw'ibyuma biremereye	Ibisigazwa byabyo	Mu mazi cyangwa mu butaka	Gupimisha ubutaka kenshi no kudakoresha igice cy'umurima cyanduye

Imbonerahamwe ya 6 Ubwoko bwa Mikorobe zitera ibibazo

Igitera ingorane	Ingorane iboneka	Ikibitera	Uburyo bwo kubirwanya bukunze gukoreshwa
<b>Ingorane ziterwa na Mikorobe</b>			
Abakozi n'abasura	Staphylococcus aureus	Isuku y'abakozi n'abasura idakurikiranwa neza bikanduza umusaruro	<ul style="list-style-type: none"> <li>- Guhugura abakozi ku kugira isuku ku mubiri.</li> <li>- Kumenyesha abashyitsi n'abafatanyabikorwa</li> </ul>
Ifumbire ikomoka ku matungo	E-coli	Kwanduzwa n'umwanda w'amatungo cyangwa w'abantu bigatera gukoresha amazi yanduye mu kuvomerera	Kuyobora amazi neza, Guhitamo site neza no gupima amazi ukoresha uvomerera
Amazi	Salmonella	Gukoresha amazi atatunganyijwe	Gupima amazi mu buryo buhoraho
Amatungo yo mu rugo	Campylobacter Listeria spp	Kutagira uburyo bunoze bwo gutunganya imyandaKutamena gucunga ubushyuhe	Kubuza amatungo yo mu rugo kugera ahari umusaruro cyangwa mu murima
Gukoresha amazi arimo isayoumwanda	Vibro	Gukoresha amazi yakoreshejwe ibindi mu kuvomerera	Kwirinda gukoreshwa amazi arimo umwanda/ibumba ufumbire
Ibintu byaboze	Clostridium	Ifumbire y'imborera itaboze neza	Gupima ifumbire mbere yo kuyishyira mu murima

### 3.3 Gukurikirana inzira umusaruro ucamo uherye aho wahinzwe kugera ku isoko (Traceability)

Ugendeye kuri "Codexalimentarius", Ikurikirananzira ry'umusaruro ni uburyo bwo gukurikirana urugendo rw'ikiribwa kuri buri rwego uherye aho cyahinze, aho cyatunganyirijwe n'uko cyagejwe ku baguzi bihurizwa mu ihame ryo kumenya aho igicuruzwa kigeze ku gihe runaka.

- I. **Ikurikirananzira (Traceability)**, rireba ubushobozi bwo kumenya aho igicuruzwa kigeze n'uko kimeze mu gihe runaka mu ruhererekane ruzwi;
- II. **Ikurikirana (Tracing)**, bivuga ubushobozi bwo kubaka amateka y'urugendo igicuruzwa cyacyiyemo ushingiyeye ku nyandiko zabitswe mu ruhererekane rwacyo.

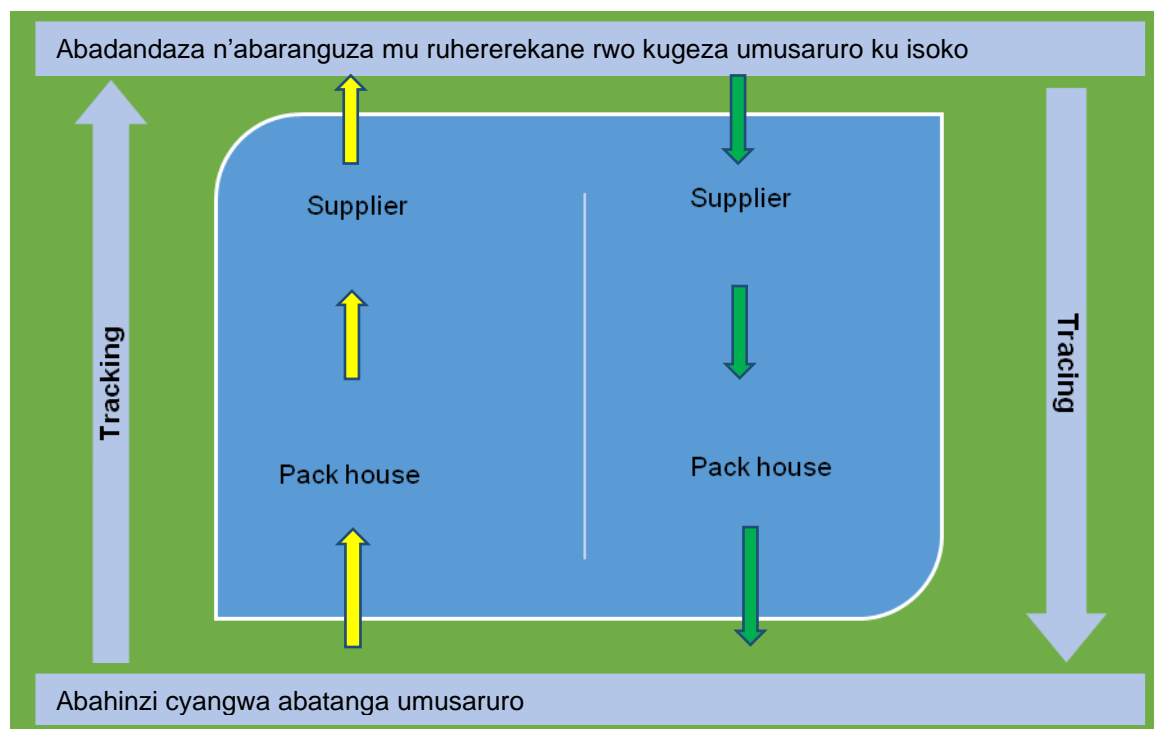
### 3.3.1 Kuki ikurikirananzira ari ngombwa?

Ikurikirananzira rikozwe neza ritanga ishusho y'ingenzi y'ubwiza n'icyizere cy'ubuziranenge mu ruhererekane nyongera gaciro rw'imbuto n'imboga. Igicuruzwa gishobora gukurikiranwa usubiye inyuma aho cyahinzwe, ubwoko butandukanye bw'inyongeramusaruro zakoreshejwe, ibikorwa byagikozeho mu kugihinga, ibyo cyakorewe nyuma yo gusarurwa, uburyo cyabitswemo n'uko cyacurujwe. Bifasha kandi kumenya urugendo igicuruzwa kirimo n'aho kigeze mu ruhererekane kirimo kuva kuwagihinze kugera mu ku muguzi wa nyuma cyangwa umuryi wacyo.

Ikurikirananzira rifasha kugarura ikiribwa gifite ikibazo bityo bigafasha abaguzi kubona amakuru akenewe kandi ya nyayo ajyana n'igicuruzwa runaka mu gihe gito gishoboka. Mu murima ufite inyandiko z'ikurikirananzira umusaruro ucamo bifasha ko buri igicuruzwa kiba gifite umurima cyaturutsemo cyangwa itsinda ryagihinze.

Amakuru ku isarura ahuza loti y'ibicuruzwa mu ruhererekane nyongeragaciro n'inyandiko z'aho cyahinzwe cyangwa umuhinzi wa nyawe wagihinze. Kuri buri rwego rwo gutunganya umusaruro uva mu buhinzi, amakuru y'ikurikirana ryacyo agomba gufatwa akandikwa.

Ishusho ya 6 Uko ikurikirana rikorwa mu ruhererekane rwo kugeza imboga n'imbuto ku isoko



### 3.3.2 Ni ibihe bice by'Ingenzi bigize Ikurikirananzira?

Ikurikirananzira rikorwa neza rigira uburyo bw'inyandiko n'uburyo bwo guha ikimenyetso umusaruro bigatuma uwo musaruro ubasha gukurikiranwa kuva k'uwawuhinze kugera ku muguzi wa nyuma (uwurya). Inyandiko zaba iz'ikoranabuhanga, zaba izisanzwe zigomba kubikwa kuri buri rwego, ni ukubuga ku murima, ku ikusanyirizo, ku mucuruzi urangura, ku mudandaza, ndetse no mu gihe bitwawe (mu ndege, mu muhanda cyangwa mu Nyanja) kuri buri rwego muri izi.

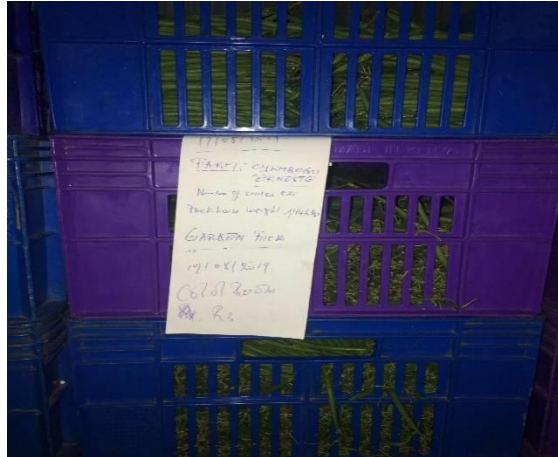
### 3.3.3 Ni ugute umuhinzi muto yashyira mu bikorwa gukurikirana inzira y'umugaruro?

Ku rwego rw'umuhinzi muto, ikirango cyoroheje cy'intoki n'inyandiko y'ibyo yakoreye igihingwa kuri buri rwego biba bikenewe (Ishusho ya 7 n'ya 8).

Ishusho ya 7 Urugero rw'ikirango cy'ukurikirana ku gipande cy'umurima



Ishusho ya 8 Amakuru y'ukurikirana ku ikureti y'imiteja



### 3.4 Isuku ku mubiri n'isukura

Abakozi bo mu murima ni ingenzi cyane ku birebana no gukumira iyanduzwa ry'ibiribwa. Abakozi, abashyitsi n'abafatanyabikorwa (Abaguzi) bagomba gukora ibyangombwa byose ariko ubwiza n'ubuziranenge bw'ikiribwa bugasigariswa. Ubufasha bw'inyigisho n'amahugurwa bigamije kurema umuco wo gukora ibikorwa byiza bigabanya ingorane ziterwa n'isuku nke bigomba guhoraho kugirango abakozi bumve neza ibisabwa ku isuku n'isukura.

Ku murima hagomba gukorwa inyandiko y'isesengura ry'ibibazo by'isuku hagamijwe kubikemura aho hantu hose imirimo yo gutanga umugaruro ikorerwa.

Iyo mirongo ngenderwaho yanditse igaragazauko ibintu bikorwa ni ishingiro ryo gushyira mu bikorwa icyizere cy'ubuziranenge bw'ibiribwa. Iyo mirongo ngenderwaho yakagombye kuba ikemura nibura ingorane zose ziboneka binyuze muri ibi bikurikira:

- Hakenewe Kandagirukarabe cyangwa ubundi bukarabiro bw'intoki;
- Hakenewe ibipfuko byo gupfuka igikomere cyaterwa no gukomereka uko ariko kose;
- Kutanywa itabi, kutarira cyangwa kutanywera ahantu runaka hatemewe;
- Imenyeshya ry'uburwayi biciye mu gusuzuma abakozi, abashyitsi n'abafatanyabikorwa mufitanye amasezerano ushingiyeye cyane ku bimenyetso by'uburwayi nko kuruka, kweruruka no guhitwa. Abakozi bagaragaje ibi bimenyetso bagombye guhitwa babuzwa kugera ahantu bakora ku musaruro w'ibiribwa.
- Kugaragaza ibiribwa byandujwe n'amatemabuzi ava mu mubiri;
- Gukoresha imyambaro y'ubwirinzi ikwiye mu gihe uri gukora mu musaruro.

Amahugurwa ni ihame ry'ibanze kugirango ugere ku bwiza n'ubuziranenge bukwiyeye bw'ibiribwa. Gukoresha ibimenyetso byereka ingamba zashyizweho ni ihame ntakuka mu kuzamura imyumvire mu bakozi, abashyitsi n'abafatanyabikorwa mufitanye amasezerano.

Bimwe muri ibyo bimenyetso bikunze gukoreshwa harimo:



### 3.5 Isuku n'isukura mu murima

Ibyorezo biriho muri iyi minsi bifitanye isano n'ubuziranenge bw'ibiribwa nk'ibisazi by'inka n'ibicurane by'ibiguruka byatumye abaguzi basaba garanti ihagije ku buziranenge bw'ibiribwa bahabwa n'abahinzi, abacuruzi n'abandi bose bafite aho bahurira n'uruhererekane nyongeragaciro rw'ibiribwa, abahinzi bategetswe gutanga garanti, gufata inshingano no kwemeza kuzira ubwandu k'umusaruro w'ibiribwa bashyira ku isoko.

Kubera ko ingorane zitukuka ku buziranenge bw'ibiribwa bishobora guturuka mu murima aho umusaruro uturuka, mu kuwufunga, mu kuwikorera, gushyiraho ubugenzuzi bukakaye hasi aho umusaruro uturuka ni ingingo yo kwitaho cyane. Na none kandi, inyinshi mu mbuto n'imboga biribwa ari bibisi ku bw'iyi mpamvu byatera ingorane zo ku rwego rwo hejuru ku bazirya mu gihe cyose amabwiriza y'ibikorwa by'isuku adakurikijwe.

Ibikorwa byinshi bikorerwa ku murima bigomba kuba bitanga icyizere cyo kugabanya mu buryo bwose ingorane zikunze kuboneka mu buziranenge bw'ibiribwa.

### 3.6 Kurwanya ibyonnyi

Udukoko n'ibyonnyi bifatwa nk'ikinyabuzima icyo aricyo cyose kirya umusaruro haba mbere yo gusarura cyangwa nyuma yo gusarura. Uretse kuba ari n'ishingiro ryo gutakaza amafaranga y'uwo musaruro, ibyonnyi ni inzira ikwirakwiza ubwandu butera indwara mu kiribwa.

Ibyinshi mu byonnyi biboneka ku rwego rw'umurima harimo imbeba n'ibisa nazo, amasazi yangiza imbuto, Ibinyugunyugu, bisaba rero gahunda yo kubirwanya nko gushyira imitego mu murima kugenzura ibyo ibice wazitegeyeho no gukoresha uburyo bukomatanyije bwo kurwanya indwara n'ibyonnyi.

Uretse kuba bifite uruhare runini mu gukwirakwiza indwara, ibyonnyi bishobora kurogoya ubuhahirane iyo bitarwanyijwe neza. Umubare munini w'ibyonnyi biri mu gice cyashyizwe mu kato ku buryo biba bitagomba kuboneka mu musaruro uwo ariwo wose w'ibihingwa byoherezwa mu mahanga cyangwa bigurwa mu mahanga ku bantu bafitenye ubufatanye bw'ubucuruzi n'u Rwanda. Bimwe muri ibyo byonnyi harimo amasazi y'umweru (*bemicia tabaci*) yangiza imiteja ndetse n'ibindi bihingwa, "African cotton leaf worm" (*Spodoptera littoralis*), "Corn ear worm" (*helicoverpa zea*) yangiza imiteja n'ibindi.

Ibyonnyi byo mu murima ndetse n'uburyo byangiza umusaruro

Ishusho ya 9 Inyenzi



Ishusho ya 10 Imbeba zo mu murima



Ishusho ya 11 Amasazi y'umweru (Bemisia tabaci)



Ishusho ya 12 Ikinyugunyugu (Maruca vitrata)



Ishusho ya 13 Agasimba gatobora amababi (leaf miner) ku bishyimbo- Icyana (Liriomyza sativae )



Ishusho ya 14 Agasimba gatobora amababi (Leaf minor) kari ku muteja- Isazi nkuru (Liriomyza sativae)



### 3.7 Guhangana na aleriji

Ibiribwa bitera aleriji bisobanubwa nk'ibintu iyo biriwe bishobora gutera umubiri impinduka ndetse kuri bamwe zishobora gutera ikibazo gikomeye mu mubiri. Ibiribwa byose biba byifitemo kuba byateza izo mpinduka, ariko na none hari ibiribwa bimwe bitera impinduka zikaze mu mubiri w'ababiriye.

Mu muryango w'ibihugu by'Uburayi, hari ibintu biba mu biribwa bigera kuri 14 byashyize mu rwego rw'ibitera ingaruka mu mubiri, amategeko akaba ateganya ko bigomba kuba bigaragara mu birango by'ibiribwa. Ibyo bintu harimo: Sereri, mustard, Ibinyamisogwe birimo guluteni, Amagi, Ibinyonjogoro, Amafi, Imbutu za sezame, Ubunyobwa, shellfish, soya, sulphur dioxide.

Aleriji mu mbuto n'imboga ntabwo ari ikibazo gikomeye cyane ndetse kubiteka byica ibyinshi mu bitera iyo aleriji biri mu mboga n'imbutu. Gusa na none utuvungukira tw'ubunyobwa na soya ni ikibazo ahategurirwa imboga cyane cyane iyo aho ziteguriwe hasanzwe hanatunganyirizwa ibiribwa birimo utu tuntu dutera aleriji.

Imbaraga nyinshi zishobora gushyirwa ku rwego rw'umurima kugirango abasarura umusaruro w'imateja birinde kuwuhuza n'ibi bintu byifitemo izi ngirangingo zitera aleriji.

Ishusho ya 15 Ubunyobwa bukunzwe kwanduza imiteja iyo bivanze mu murima



Ishusho ya 16 Makadamiya ntigomba guhingwa mu murima uhingwamo imiteja



### 3.8 Uburiganya mu bucuruzi bw'ibiribwa no kurengera ibiribwa

Kurengera ibiribwa birebana n'uko umuhinzi ashiraho ingamba zo kwirinda ko habaho bigambiriwe ikintu cyabangamira ubuziranenge bw'ikiribwa. Kurengera ibiribwa ni ubuhanga bunyura mu gusesengura ingorane zishobora kuboneka n'ibintu byose bishobora gutera ibibazo, ingamba zafashwe kugirango ako kaga gaturutse bu biribwa kirindwe. Bimwe mu bikorwa byoroheje bikorwa mu kurengera ibiribwa harimo gukoresha imodoka zifunze mu gihe utwaye umusaruro uva mu murima, kuwufunga, ndetse no mu gihe utwaye umusaruro watunganyijwe kugirango hirindwe uburyo bwose bwahumanya ibiribwa bukozwe ku bushake.

Uburiganya ku biribwa buvuga gusimbuza nkana, kongeraho, kugaragaza ibiribwa uko bitari, ibigize ibiribwa cyangwa uko wafunze ibiribwa, cyangwa se kwandika amakuru atariyo ku birango by'igicuruzwa ugamiye indamu. Urugero ku miteja ni ukuntu mu ikureti ushobora gushyira imiteja myiza minini hejuru ku bushake ugamiye kwerekana ko imiteje yose watanze ariko imeze no hasi. Igiciro cy'imateja myiza minini igihe cyose kiba kiri hejuru y'igisanzwe.

### 3.9 Kugira inyandiko z'ibihamya no kubika amakuru

Kugira inyandiko z'ibihamya no kubika amakuru ni ipfundo ryo gushyira mu bikorwa, gukurikirana, no kugira ibihamya ku buhinzi bufite gahunda nziza ikora neza. Ku bahinzi bashaka kubahiriza ibisabwa mu gushyirwa ibyemezo by'imikorere myiza n'ubuziranenge (Certification), basabwa kugira inyandiko zibitse amakuru ari ku gihe nibura mu myaka ibiri. Igenzura ry'ibanze mu kureba ko wujuje ibisabwa ngo ubone icyemezo cya "Global GAP", nibura ugomba kuba waragiye ubika inyandiko n'amakuru mu mezi atatu. Izi nyandiko zishobora kubikwa mu buryo bw'ikoranabuhanga cyangwa se zanditse bisanzwe ku mpapuro, ariko na none ku nyandiko zibitse mu ikoranabuhanga, zigomba kuba zibitse neza ku buryo byoroheza kuzigeraho.

Ifishi y'amahugurwa ni igice gikomeye ku bukungurambaga no kugirango wizere ko gahunda zikorwa zubahiriza ibikorwa byiza byemewe ku rwego mpuzamahanga. Inguni zirebana



n'amahugurwa ku kwita ku musaruro zigomba kwitabwaho cyane ku rwego rw'umurima. Murizo harimo:

- Isuku ku mubiri n'isukura;
- Uburyo bwiza bwo gukoresha imiti irwanya indwara n'ibyonnyi;
- Ubutabazi bw'ibanze;
- Amabwiriza yo gusarura, Kugenzura ubwiza, isuku n'isukura ku kiribwa.

### 3.10 Ubwiza bw'amazi ku rwego rw'Umurima

Amazi ni ikintu nkenerwa cy'ibanze kugirango uhinze ibitanga umusaruro w'ibiribwa. Kwegera amazi, uburyo abonekamo n'uburenganzira bwo kuyakoresha ni ibintu by'ingenzi mu buhinzi bw'imiteja. Ubwiza bw'amazi bugira ingaruka ku bwiza n'ubuziranenge bw'umusaruro. Ni ngombwa gukora isesengura ry'ibibazo bishobora kuboneka bigendanye n'amazi akoreshwa mu buhinzi. Iri sesengura riba rigomba kugaragaza niba ayo mazi ari meza ku buryo yakoresheye mu buhinzi bw'igihingwa runaka.

Ubwiza bw'amazi buhumanywa n'ibintu bishobora kuba bifatika, ibituruka ku binyabutabire cyangwa na za mikorobe.

Ibyinshi mu bihumanya amazi bituruka ku binyabutabire ahanini bituruka mu ikoresheye ry'imiti irwanya indwara n'ibyonnyi ndetse n'amafumbire mvaruganda, mu gihe ibihumanya bituruka ku bintu bifatika harimo amabuye, ibitataka birenze n'ibirahuri. Ibihumanya bituruka kuri za mikorobe biva cyane cyane ku bikorwa bikorerwa aho amazi aturuka nk'imyanda y'amatungo n'ibindi.

Isuzuma ningombwa kugirango umenye urwego guhumana biriho, bikaba byanatuma ukenera gutunganya ayo mazi mbere yo kuyakoresha. Ni ngombwa kumenya urugero rwihanganirwa rwa za mikorobe ziboneka mu myanda abantu n'amatungo basohora nka "E-coli" cyangwa se bagiteri yitwa "hermos-coliform". Amabwiriza y'Ishami ry'umuryango w'Abibumbye wita ku buzima (WHO) ku mazi anyobwa ashobora kwifashishwa mu kureba ubwiza bw'amazi akoreshwa.

Bisobanuke neza ko amazi yakoreshejwe agatunganywa ashobora gukoreshwa mu kuranga imiteja ari uko yujuje ibisabwa n'amabwiriza y'Ishami ry'umuryango w'Abibumbye ryita ku buzima (WHO) ku birebana n'ikoresheye ry'amazi yari yakoreshejwe, mu buhinzi no mu bworozi bw'amafi yo muri 2008. Ibyavuye mu isesengura ry'amazi akoreshwa bugomba kwandikwa bikabikwa.

Ishusho ya 17 Ikoreshwa ry'ikiyaga cya Muhazi (amazi mashya atakoreshejwe ibindi), Amazi akwiriye mu buhinzi bw'imiteja



## IGICE CYA 4: IMPAMVU ZIGIRA URUHARE MU KWANGIRIKA K'UBWIZA BW'IMITEJA

### Ingingo nkuru zo kwitaho

Iki gice kirafasha umusomyi kugira amakuru yo mu rwego rwa tekiniiki ku bintu byose bigira uruhare mu kwangirika k'ubwiza bw'umusaruro, inkomoko y'ibyo bibazo n'ingaruka bishobora kugira ku musaruro

### 4.1 Impamvu zigira uruhare mu kwangirika kw'ubwiza bw'imateja (Izituruka ku bidafite ubuzima n'izituruka ku bifite ubuzima)

Impamvu zitera iyangirika ry'umusaruro zirimo izituruka ku bidafite ubuzima n'izituruka ku bifite ubuzima.

#### 4.1.2 Izituruka ku bidafite ubuzima

##### *4.1.2.1 Impamvu zituruka ku bikorehwa ku musaruro (kwangirika kw'umusaruro guturuka ku bakozi n'ibikorehwa bakoresha)*

Kwangirika guturutse ku bikorehwa ku musaruro bishobora kuba nko kuwukata, gukuba cyangwa guhindura imimerere, binatuma akenshi igishishwa gihindura ibara. Kwangirika guturutse bu bikorehwa cyangwa ibintu bifatika, a kuzamura uburyo bwo guhumeka, gutakaza amazi, gukorwa kwa Etilene ndetse no kuba ikiribwa cyakwinjirwamo n'ubwandu bwa mikorobe binyuze aho cyakaswe cyangwa cyakomerekejwe. Uku kwangirika kugira ingaruka ku ntungamubiri cyari cyibitsemo, uburambe bwacyo no gutakaza ubwiza bushingiye ku bubisi. Ku miteja, kwangirika guterwa no gukoresha ibikorehwa bitemewe mu gusarura, harimo ikorehwa ry'imifuka, kutayipanga neza mu gihe cyo gusarura, kuyitwara mu buryo budakwiriye, gupakira imiteja myinshi mu makureti n'ibindi. Muri rusange kwangirika biterwa no gukorwaho, gutsindagirwa, Kwikubanaho no kwicugusa.

Amashusho ya 18 kugeza kuya 21 ari hasi arerekana zimwe mu mpamvu zitera kwangirika kw'imateja bitewe n'ibyayikozeho.

Ishusho ya 18 Imiteja yasaruriwe mu makureti mazima



Ishusho ya 19 Imiteja yasaruriwe mu mifuka bigatera kwitsindika gukabije ikangizwa no kwitsindagira



Ishusho ya 20 ikureti yapakiwe neza ntirenze ibiro 16



Ishusho ya 21 Imiteja myinshi yapakiwe mur ikureti ya jumbo irengeje ibiro 27 (kwangirika guturutse ku kwitsindagira)



Ukwangirika guterwa no gukorwaho bishobora gutera ko gukorwaho, gutsindagirwa, kwikubanaho no kwicugusa

#### 4.1.2.2 Kwangirika guterwa no gutsindagira

Uku kwangirika kuboneka iyo umusaruro urengejweho ibintu biremereye, wabinyeganyeza cyangwa utabinyeganyeza. Ibi bibaho iyo ibyo utwaramo umusaruro bitujuje ubuhagarike bukwiriye, gupakira nabi umusaruro, cyangwa se gupakira ukageza hejuru cyane bituma ibipakiye hejuru byitsindagirana uburemere ku byabanjwe hasi (Ikoresheya ry'amakureti ya jumbo mu miteja), gupakira ukarenza, cyangwa se gushyira umusaruro mu bintu bitujuje ibisabwa ngo bitware umusaruro nk'imifuka. Muri rusange ibi bitera guhindura ishusho, kuvunika, kumeneka no kwisatura.

Ishusho ya 22 Imiteja yapakiwe neza mu ikureti



Ishusho ya 23 Ikureti yapakiwemo imiteja myinshi bikabije



#### 4.1.2.2 Kwangirika guterwa no kwikubanaho

Uku kwangirika kubaho iyo uruhu rw'umuteja rwikubye ku kindi kintu bigatera gukoboka. Bishobora gutera kuvaho kw'agashishwa kaba gafunitse umusogwe w'imateja. Ku miteja, umuyaga wagaragaye ko ariwo ukunda guteza uko kwikubanaho kw'imisogwe. Kugirango ubirwanye, utera ibiti bikikije umurima ku muzenguruko kugirango bijye bigabanya umuvuduko w'umuyaga.

Ishusho ya 24 Inkovu ku miteja zatututse ku kwikubanaho guterwa n'umuyaga



**Ubwuryo bwo kubirwanya:** Gutera ibiti bigabanya umuvuduko w'umuyaga ku muzenguruko w'umurima ni ingenzi cyane.

#### 4.1.2.3 Kwangirika guterwa ko kwitura hasi cyangwa kwikubita ikindi kintu

Ubu buryo bwo kwangirika kw'umusaruro bibaho iyo habayeho kwikubitanaho hagati y'umusaruro cyangwa kwikubita ku kindi kintu gikomereye ariko habayeho ko bikorwa ku muvuduko cyangwa n'imbaraga. icyo gihe bitera impfunira ishobora kugaragaza gukomereka inyuma ku gishishwa cyangwa ntibigaragare inyuma. Ubu buryo bwo kwangirika kw'umusaruro w'imateja guterwa no kutubahiriza ibisabwa mu gihe uri gupakira mu modoka cyangwa upakurura.

#### 4.1.2.4 Kwangirika guterwa no gucugusa

Ubu buryo bwo kwangirika bufitanye isano no gutwara umusaruro bukaba bubaho iyo utwara umusaruro mu muhanda uwucekagura bya hato na hato mu muhanda utameze neza mu gihe kirekire. Gucugusa umusaruro bishobora gutera iyangirika ritewe no kwitsindagira, kwikubanaho, kwituranaho cyangwa kwitura ku bindi bintu.

Mu rwego rwo kubirwanya, ugomba kugerageza kuringaniza neza umuhanda ujya ku murima ukavanamo ibinogo kugirango ugabanye ukwangirika guterwa no kwicugusa kw'imodoka, ugomba na none kureba amarasoro n'uburyo butuma imodoka igenda hasi bumeze neza (Suspension). Gupakira bigomba gukorwa mu buryo bwiza ku buryo ibisanduku birimo umusaruro biteretse neza ku buryo nta kunyeganyega cyangwa kwicugusa biza kubamo mu gihe cyo gutwara umusaruro.

#### 4.1.3 Impamvu zituruka ku miterere y'ikirere n'ibidukikije (Harimo n'ubushyuhe)

Impamvu zituruka ku miterere y'ikirere nk'umuvuduko w'umuyaga n'ubushyuhe bigira uruhare ku bwiza bw'umusaruro binyuze mu mihumekere, ikorwa rya etilene no gutakaza amazi mu mikurire y'igihingwa.

Ubushyuhe bwinshi n'ububobere bwo hasi byongera uburyo bwo gukora cyane mu biribwa bibisi bigatera gutakaza amazi kwabyo. Kugrango wirinde ibi, gukonjesha umusaruro ku gihe kigenwe ndetse no kuwuhumisha mu bubiko bufite ubuhehere bwinshi nibwo buryo bukoreshwa mu kwitondesha umuvuduko ikiribwa kibisi gikoresha cyane ibikigize bityo kikamara igihe kitari cyangirika.

Ubukonje bukabije cyane butera akaduruvayo mu mikorere bikageza kuri balafu ndetse ikiribwa kikangizwa n'ubwo bukonje bukabije (igishishwa kigahindura ibara, gucikamo ibyobo). Umwuka mucye ndetse n'urugero rwo hejuru rwa Karubone irimo amazi mu bubiko cyangwa mu mapaki afunzemo ibiribwa bitera akaduruvayo muri icyo kiribwa gatewe no kuba bimeze nk'ibitaze.

Ku miteja, ubushyuhe bwemewe ugomba kuyibikaho ni hagati ya dogere 5 na dogere 8 za selisiyusi mu gihe urugero rw'umwuka rukwiye ari 3-5% naho karubone irimo amazi ikaba ku rugero rwa 5-10%.

#### 4.1.4 Impamvu zituruka ku bifite ubuzima

##### 4.1.4.1 Impamvu zituruka muri za mikorobe (uduhumyo, bagiteri, inzoka na Virusi mu gihingwa)

Mikorobe nizo soko ya mbere y'ukwangirika kw'imbuto n'imboga. Inyinshi mu ndwara zifata umusaruro w'imboga nyuma yo kuwusarura ziterwa na bagiteri, mu gihe ku mbuto ho ziterwa n'uduhumyo.

Indwara zigabanya ubwiza bw'umusaruro bigatera igihombo gikomeye ku bahinzi. Ugomba kumenya ko indwara nyinshi ziboneka mu musaruro nyuma yo kuwusarura ziba zarawufashe mbere yo gusarurwa.

Kuri izo ndwara iyo zigaragaje ibimenyetso mbere y'isarura, biba bishoboka kvanamo umusaruro wafashwe wose nta ngorane mu gihe usarura. Ku rundi ruhande ariko, ku ndwara zigaragaza ibimenyetso nyuma yo gusarura, biba bigoye ko wabona ubwo burwayi ngo uvanemo ibyafashwe mbere yo kuwufunga no kuwohereza ku isoko. Ibimenyetso bitangira kugaragara ibiribwa byageze ku muguzi/umuryi (Urugero rw'Akaribata ku ishusho ya 25 n'uruhumbu ku ishusho ya 26) bigatera kujugunya umuzigo wose uko waje bityo umuhinzi akaba aguye mu bihombi bikomeye. Ni ngombwa kumenya kandi ko kurobanura no gupakira mu gihe cy'imvura bitera ijugunywa ry'umusaruro rikabije riterwa n'uburwayi ugereranyije no kubikora mu gihe cy'imicyo.

Gufatwa n'indwara kw'umusaruro bishobora kuba mbere yo gusarura cyangwa nyuma yo gusarura iyo bidakozwe neza. Kwandura mikorobe bishobora kubaho bitewe no gukoresha uburyo budakwiye mu kwita ku igihingwa mu murima, bitewe n'abakozi cyangwa se umusaruro wahuye n'igitaka cyangwa wakoze ku kintu cyose cyanduye. Ibintu bisarurirwamo nabyo bishobora kuba byandujwe n'utuzinga twa mikorobe bikaba byaba isoko yo kwandura indwara ku musaruro kandi wo wari muzima. Kubera iyo mpamvu, kubungabunga ubwiza bw'umusaruro bisaba kwita ku byawanduza mu murima ariko ukanita ku byawanduza nyuma yo kuwusarura.

Ishusho ya 25 Akaribata (*Colletotrichum lindemuthianum*) ku miteja



Ishusho ya 26 Uruhumbu/Guhuguta kw'umweru cyangwa kw'ikijuju (*Sclerotinia sclerotiorum*) ku miteja



Ni byiza kwita ku isuku ku rwego rw'umurima kugirango ugabanye ikwirakwira ry'ubwandu.

Uburyo bwo kubwirinda ni ugusukura ibikoresho bisarurirwamo no gutera umuti mbere yo gusarura mu rwego rwo gukingira cyane cyane urwanya ko umsuaruro ufatwa n'uduhumyo.

## 4.2 Impamvu zituruka ku buzima bw'igihingwa (Guhumeka, Gutakaza amazi, ibibera mu gihingwa by'ubutabire bisohora etilene

### 4.2.1. Ubuzima bw'igihingwa

Imboga zasaruwe (harimo n'imateja) ziba zigizwe n'ingirangingo zifite ubuzima. Mu gihe cyo gusarura, igice ukata kiba gitandukanyijwe n'igice cyakigaburiraga, nyamara kandi igice cyasaruwe kiba kigomba gukomeza kubaho kibeshejweho n'ibigitunga kiba cyarabitse bigizwe by'intungagihingwa n'amazi. Ukugabanyuka kw'izo ntungagihingwa kiba cyaribikiye binyuze mu guhumeka no gutakaza amazi binyuze mu gututubikana bituma ubwiza butakara ndtse ikiribwa kigatangira guhangayika. Uko guhangayika bw'ikiribwa butera ikorwa rya Etilene ku rwego rwo hejuru noneho ikiribwa kigatangira guhindura ibara nk'ikimetso cyo gusaza bihita binatera ukwangirika kw'ubwiza bwacyo.

Ubukangurambaga bwibanze ku mibereho y'icyasaruwe nyuma yo gusarurwa ni ingenzi cyane mu rwego rwo kumenya uko usigasira ubwiza bwacyo ukanacyongerera igihe kimara kitarabasha kwangirika.

#### 4.2.1.1 Guhumeka

Guhumeka bifatwa nko gucagagurika kw'ibitungagihingwa cyari cyarabitse (Carbohydrates) bikavamo Karubone ivanze n'amazi (Carbone dioxide), amazi n'ubushyuhe bikozwe kubera hari umwuka (Igishushanyo cya 27 n'icya 28 kwiyegegeranya gukabije mu ipaki ya palasitiki):

Ingaruka z'uku kugabanya umwuka cyangwa kongera urugero rwa gazi karubonike "CO<sub>2</sub>" (Urugero nk'iyi ufungira, utwikirira cyangwa ubika ahantu wahinduye ibisanzwe bigize ikirere cyaho) guhumeka biragabanyuka, bigatuma bwa bwiza bw'ikiribwa butinda kwangirika na cya kiribwa kikamara igihe kitarapfa. Mu gihe nyamara, umwuka muke cyane na gazi karubonike iri ku rwego rwo hejuru bitera uguhumeka kudakoresheje umwuka (gutara) bigatera akavuyo mu mikorere y'ubuzima bw'ikiribwa no gukariha (gutakaza uburyohe bwacyo) bigatera kugabanyuma bw'uburambe bwa cya kiribwa.

Ni byiza rero kubanza gukonjesha umusaruro ukabanza ukawuvanamo ubushyuhe mu buryo bushoboka bwose, ariko na none bigakorwa neza wirinda ko wangiza ingirangingo zigize ikiribwa byaterwa n'ubukonje bukabije.

Ishusho ya 27 Kwiyegeranya kw'imateja kwatewe n'uko itakonjeshejwe mbere bihagije



Ishusho ya 28 Kwiyegeranya byo ku rwego rwo hejuru ku miteja yapakiwe mu gakarito bitewe no kudakonjeshwa bihagije mbere



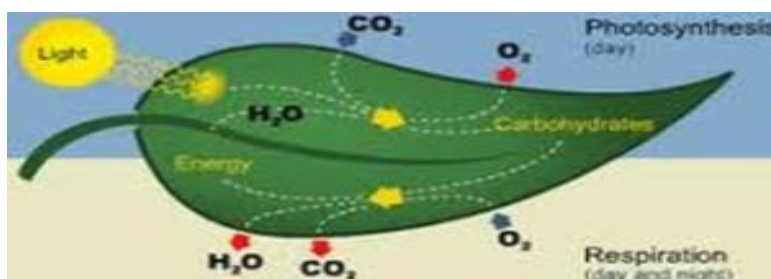
#### 4.2.1.2. Ingaruka zo kudacunga uguhumeka kw'imateja

- Uguhumeka kwihuse kw'imateja guteza ibihombo by'umugaruro mu buryo bw'ibiro, kwangirika kw'ubwiza, gutakaza imisusire n'uburyohe bwayo.
- Imitēja kimwe n'izindi mboga nyinshi, ntabwo ihisha nyuma yo kuyisarura kandi ntabwo igira igihe cyo guhumeka byo ku rwego rwo hejuru mbere y'uko bipfa cyangwa mbere ko ubwiza byayo bwangirika burundu.
- Uko ikiribwa gihumeka cyane niko n'ubwiza bwacyo bwangirika ni nako kandi uburambe bwacyo buba bugufi.

Imbonerahamwe ya 7 Urugero rw'imihumekere mu biribwa bukunda kuboneka.

Ibiribwa bidahisha nyuma yo gusarurwa	Ibiribwa bihisha nyuma yo gusarurwa	Urwego biriho	Urwego rw'imihumekere @ 5°C (mg CO <sub>2</sub> /kg.h)
Karoti, Shufurere, Ibitunguru bivamo salade, Letu, Ibishyimbo bya lima, Tangawizi.		Hejuru	20-40
Kokombure, Puwavuro na Sereri	Inyanya	Ruringaniye	20-40
Imbuto n'imboga byumishije	Imbuto za date	Hasi cyane	<5
Ibinyabijumba: Ibirayi, Imyumbati, ibitunguru by'amateke na Tungurusumu		Hasi	05 to 10
Imiteja, Borokori, okara, Imitēja y'ubwoko bwose, Broccoli, Okra, soya, Ibigori n'amashu	Pawupawu	Hejuru cyane	30-60
Amashaza, Asiparagusi, Ibihumyo, Epinari, Ibigori by'urwunyonyu, Uruvagitirane rw'imboga		Hejuru cyane by'indengakamere	>60

Ishusho ya 29 Uko igikorwa cyo guhumeka gikorwa mu kibabi cy'umuteja



#### 4.2.1.3. Ikorwa rya Etilene

Etilene ( $C_2H_4$ ), ni imvubura yo mu rwego rwa gaze itangiza kandi ikihutisha guhisha kw'ikiribwa binyuze mu guhindura ibara aribyo gutangira gupfa bwacyo. Ingirangango zose z'ibihingwa zisohora Etilene ku rwego rutandukanye. Imbutu zikora Etilene nyinshi ugereranyije n'imboga, ariko na none imboga zibangamirwa cyane na Etilene ariyo mpamvu utagomba kuvanga imboga n'ibindi biribwa bigira Etilene nyinshi nk'Imineke, Amatunda, avoka n'izindi mbuto.

Iyo imiteja ishyizwe umwanya munini aho ihura na Etilene ihita iba umuhondo. Kurwanya isohoka rya Etilene n'ingaruka igira mu kwihutisha guhisha kw'imateja bikorwa uyikonjesha ukuyivana mu murima hanyuma na nyuma ukayibika mu byumba bikonjesha biri ku bushyuhe bwa dogere 5 kugeza kuri dogere 8.

Ishusho ya 30 Vangura imiteja n'ibindi biribwa mu kuyibika



Ishusho ya 31 Kuvanga imiteja n'amatunda mu cyumba kimwe gikonjesha si byiza



Kuvangura umusaruro ukurikije urwego buri bwoko busohoramo etilene ni ngombwa cyane, ukurikije ibisohora etilene nyinshi, ibisohora iringaniye n'ibisohora nkeya.

Mu bubiko buteye imbere, cyangwa mu gutwara umusaruro ku ntera ndende nko mu Nyanja, ugomba gukoresha imiti imira etilene (Potassium permanganat ( $KMnO_4$ )) cyangwa ibuza Etilene gukora (Methylcyclopropene cyangwa 1-MCP).

#### 4.2.1.4 Gututubikana

Gututubikana kw'icyasaruwe, ni uburyo gitakazamo amazi binyuze mu gukora kw'ingirangango zikigize bihura na none no gusohora amazi agahinduka umwuka (evapotranspiration), aho amazi ahinduka icyokotsi cy'umwuka bikoze n'ubushyuhe.

Ibyasaruwe bitakaza amazi bitewe no kuzamuka kw'isunika ryo mu ngirangango z'ibyasaruwe mo imbere ugereranyije n'isunika ririri mu kirere, bikanahura kandi n'urugero rw'ubuherere akenshi buba buri kuri 98-100% mu byasaruwe bigatera gushonga kw'ingirangango (Gutakaza amazi).

Kugirango ugabanye gututubikana (gutakaza amazi), ugomba kuzamura ubuherere bwo mu bubiko ubitsemu ibyasaruwe ukabugeza kuri 80% ukanagabanya ubushyuhe bubikikije, ibi bihita bikora urukuta rubuza amazi gusohoka biyo ukaba ubujije ibyasaruwe gutakaza amazi.

Ibihingwa bifite uburyo bwinshi bwo kwirwanaho ngo bidatakaza amazi, aha harimo agahu kagabanya gututubikana. Ibi nibyo biba ku bwoko bw'imateja afite ubwo buryo bwo kubuza gutakaza amazi bituma ibasha kumara igihe kirekire ugereranyije n'andi moko y'imateja adafite ubwo buryo.

Uretse kuba byangiza ubwiza, gutakaza amazi binagabanya uburemere bw'umusaruro wari bugurishe bigatera ibihombo biri hejuru ya 5%, iki kikaba ari igihombo kinini kinatera kunama kw'ibyasaruwe.



Ishusho ya 32 Uburyo busanzwe bw'imiteja ibitse mu cyumba gikonjesha



Ishusho ya 33 Imisogwe yatakaje amazi kubera kubikwa ahantu hari ubushyuhe bwinshi



Imbonerahamwe ya 8 Ibyiciro byo kubora kw'umusaruro

Urwego rwo kubora		
Icyasaruwe	Igipimo cyo kubora	Igihe icyasaruwe gishobora kumara
Borokoli, Shufurere, Inkeri, Buluberi	Hejuru cyane	Munsi y'ibyumweru 2
Avoka, Seleri, Inanasi, Imitēja, Inyanya	Hejuru	Ibyumweru 2-4
Indimu, Watemeloni, Ibirayi n'imyembe	Biringaniye	Ibyumweru 4-8
Ibitunguru by'amateke, Pome, Tungurusumu, n'urubuto rwitwa pear (mu bwoko bwa pome)	Hasi	Ibyumweru 8-16
Imbutu n'imboga zumishijwe Dried fruits and vegetables, Ubunyobwa n'ibisa nabwo	Hasi cyane	Ibyumweru 16-36
Imboga zashyizwe ku bukunje bwo hasi cyane	Hasi by'indengakamere	Hejuru y'ibyumweru 52

## 4.3 Ibiyane n'umusaruro

### 4.3.1 Amoko y'ibihingwa

Ubwiza n'ubushobozi bwo kuramba kw'imboga biterwa mu ruhande rumwe n'ubwoko bwazo, niyo mpamvu ushobora kubhindura biciye mu gukora amoko mashya. Gukora amoko mashya byazamuye cyane uburambe, ubwiza bukenewe koherezwa ku isoko mpuzamahanga, intungamubiri n'uburyo bwo gutunganya no kongerera agaciro umusaruro ku ku bihingwa byinshi. Izi ngingo ni ingenzi cyane kandi zirakenewe mu bihugu bikiri mu nzira y'amajyambere, aho uburyo bwo gukonjesha bugikenze ndetse n'intera ndende ibiribwa biba bigomba gukora kugirango bigere ku isoko mpuzamahanga. Kubera ibyo, amwe mu moko y'ibihingwa nka avoka ashobora hoherezwa ku isoko mpuzamahanga bitewe n'igihe amara atari yangirika kandi mbere bitarashobokaga.

### 4.3.2. Ibijyanye n'ikirere

#### 4.3.2.1. Ubushyuhe

Igihe cyiza cyo gutera, kurinda ibyo wahinze cyangwa gukoresha imbuto yihanganira ubushyuhe bwinshi bishobora kugabanya ibibazo bigendanye n'ubwiza bw'umusaruro. Ubushyuhe buberanye n'imboga zihingwa mu gice cyegereye umurungo ugabanya isi mo kabiri nk'imiteja buri hagati ya oogere 20 na 32 mu gihe ku bihingwa byo mu bukonge (nka Borokoli) zikunda ku mpuzandengo ya dogere 15.5.

#### 4.3.2.2. Imvura

Imvura nyinshi mu gihe cyegereje isarura ishobora gutuma imisogwe ijyaho igitaka bigatera kwangirika kwayo ikomereka mu gihe ujya kuyoza. Imita yoyegwe iba ifite ingorane nyinshi zo kubora mu gihe ibitswe cyangwa itwawe. Byongeyeho kandi kwandura indwara zituruka ku biribwa bitewe n'uko icyasaruwe cyari cyaragiyeho itaka mu gihe cy'imvura.

Igitaka kiba kirimo za mikorobe zitera indwara, kugirango urinde igice uzasarura ku gihingwa (urugero nk'imisogwe), ushobora gusasira umurima ukoresheje ibyatsi cyangwa ibindi byabugenewe.

#### 4.3.2.3. Izuba/Urumuri

Urumuri rwinshi rufite ubukana rushobora gutera kuzamuka kw'ubushyuhe mu gihingwa, bikaba byatera ukwangirika kw'ubwiza guterwa n'ubushyuhe bwinshi. N'ubwo mu gice cyegereye umurungo ugabanya isi mo kabiri imiteja y'ibishyimbo idakunze guhingwa ahantu hatwikiriye, isarura ryo ryakagombye gukorwa mu gihe hari amafu, ni ukuvuga mu gitondo kare cyangwa se nimugoroba.

### 4.3.3. Imirimo yo kwita ku gihingwa mu murima

Gukoresha uburyo bwiza mu buhinzi na Tekinike zo kongera umusaruro bituma ubona umusaruro ufite ubwiza bwo hejuru kandi wujuje ubuziranenge.

#### 4.3.3.1. Imbuto

Abacuruzi b'umusaruro ku bufatanye n'ababagurira uwo musaruro baba bagomba gushaka imbuto zitanga umusaruro mwinshi kandi zihangana n'indwara n'ibyonnyi.

#### 4.3.3.2. Kuvomerera

Nyinshi mu mboga ziba zigizwe n'amazi kugeza kuri 80%, kubera iyo mpamvu ziba zikeneye kuhabwa amazi ahagije kugirango zikure ku rwego rukwiye, zitange umusaruro ushimishije, ufite ubwiza kandi ubasha kubikwa nta kibazo. Uburyo bwo kuhira amazi atonyanga ku mizi y'igihingwa (Drip irrigation) bwagaragaye ko bwazamura umusaruro w'imiteja mu bwinshi no mu bwiza, hagabanywa ibihombo bituruka ku migogwe yagiyeho ibitaka, tutibagiwe no kuba butuma ukoresha amazi neza ugereranyije no kuhira ukoresheje umupira usuka amazi mu murima. Isoko y'amazi akoreshwa mu kuhira mu buhinzi bw'imboga igomba kurindwa cyane, nta hantu igomba guhurira n'amatungo bitewe n'urwego rw'ibibazo biba bishobora gutera; muri rusange, ikintu cyanduye guhura n'ikizasarurwa bigombwa kwirindwa cyane.

#### 4.3.3.3. Gufumbira n'ifumbire mvaruganda

Ibitunga igihingwa bigomba kuboneka ku rugero rukwiye. Gushyiraho ifumbire nyinshi irenze cyangwa mkeya aho igihingwa giteye byangiza ubwiza bw'umusaruro ndetse n'uburambe cyari kuzagira. Guha igihingwa Azote nyinshi kidakeneye bitera igihingwa kutabika ibigize ubwiza bw'umusaruro bikanatera akavuyo mu mikurire yacyo.

Ibibazo biterwa n'ikoreshwa rirenze ry'ifumbire mvaruganda bizamura ubusharire bw'ubutaka, kwanduza amazi yo mu butaka ritewe na Nitarate ndetse n'ibisigazwa by'ibyo binyabutabire byatumye hashyirwa imbaraga mu ikoresha ry'ifumbire y'imborera. Ifumbire y'imborerera ikomoka mu matungo ikoresha nk'ifumbire y'umwimerere ariko igomba gukoreshwa mu bwitonzi bwinshi kuko iba ishobora kwangiza ubuziranenge bw'umusaruro biturutse kuri za mikorobe.

#### 4.4. Ibibazo by'ibyonnyi-Uruhare rw'udukoko (Ibishorobwa, Tiripusi, Amasazi y'umweru)

Impungenge ku muryango mpuzamahanga ku bigendaye no kwangiza ubucuruzi bitewe no kwinjiza **udukoko** tuzanye n'ibiribwa zatumye hashyirwaho ingamba zikaze ku bafatanyabikorwa benshi bo mu bucuruzi. Amabwiriza y'Umuryango w'ibihugu bw'Uburayi asaba igenzura rikaze ku bijyanye n'ubuziranenge bw'ibihingwa kugirango birinde ko hakwinjira udukoko, bakoresheje inzira nyinshi mu gucunga ndetse no gukumira iyinjira ry'udukoko twangiza.

Umubare munini wo kwangiza k'udukoko ku mboga ubaho byaba mbere na nyuma yo gusarura, bigatera igihombo gikomeye cyo mu rwego rw'ubukungu. Umuryango mpuzamahanga w'Ubucuruzi (WTO) utangaza ko amoko agera kuri 750,000 y'udukoko azwi, muriyo, angana na 450 abarwa nk'ateye ikibazo gikomeye.

Ibyonnyi byangiza umusaruro w'imboga ku rwego rwo hejuru iyo bikiri bitoya, ni ukuvuga bigeze ku rwego rw'urunyo (Larva). Muribyho, amasazi y'umweru (*bamisa tabaci*) niyo abangamiye ubucuruzi bw'imiteja yoherezwa mu mahanga. Ibindi byonnyi harimo agasimba gatobora imisogwe y'ibishyimbo n'ibinyugunyugu (Urugero: *maruka vitrata*).

Kugenzura ibyonnyi mu musaruro nyuma yo kuwuvana mu murima bisaba gukoresha imitego ifata ibyonnyi, kubyica, kuwuhata karubone irimo amazi ku rwego rwo hejuru cyangwa ugakoresha imirasire aho bishoboka (Irradiation). Uburyo bwo kurwanya ibyonnyi ukoresheje imiti bigomba kwirindwa nyuma yo gusarura, bigakorwa gusa mbere yo gusarura nabwo ukubahiriza igihe gisabwa hagati yo gutera umuti no gusarura nk'uko biba bigaragara ku kirango cya buri muti.

Ishusho ya 34 Imiteja yarumwe n'igishorobwa



Ishusho ya 35 Ubusembwa bwatewe na Tiripusi



## IGICE CYA 5: KWITA KU MUSARURO W'IMITEJA N'IBYO UMUSARURO UGOMBA KUBA WUJUJE

### Ingingo nkuru zitaweho muri iki gice:

- Iki gice kirafasha umusomyi kumenya teknikiki zo gutandukanya ibyiciro by'imiteja ukurikije igipimo cyo kwera;
- Abasomyi barahabwa ubumenyi bw'ukuntu hakorwa imirongo ngenderaho yo gusarura n'ibisabwa mu gihe cyo gusarura ndetse na nyuma yo gusarura.

### 5.1 Kwita ku musaruro n'ibyo umusaruro ugomba kuba wujuje

Abahinzi b'imbutu n'imboga bahura n'imbogamizi mu gihe cyo gufata icyemezo niba ihingwa cyaba kigejeje igihe cyo gusarurwa. Birazwi nk'ihame rusange mu buhinzi bw'ibihingwa bitanga umusaruro ugurishwa ari mubisi, ko igihe nyacyo cyo gusarura ku bwoko butandukanye bw'imbutu n'imboga giterwa n'icyo isoko risaba kikaba ari nacyo gipimirwaho igihe nyacyo cyo kukirya.

Ibi bisabwa bikorehwa gusa ku kumenya igihe cyo kwera ku mbuto n'imboga ariko bikaba bitandukanye n'igisobanuro cyo kwera kw'igihingwa iyo ugiye mu rwego rw'ibimera muri rusange kuko icyo gihe kwera bivuga gusoza gukura kw'igihingwa. Igihe cyo kwera ku biribwa bibisi bivuze igihe urubuto rugeze igihe cyo gusarurwa ubaze igihe ruzagerera ku isoko n'ibyo ruzakorera mu nzira ruzacamo rugera ku isoko.

Ku bihingwa bitagera igihe ngo bisohore Etilene nyinshi maze bigire guhumeka kuri ku rwego rwo hejuru mbere yo gutangira kwangirika (bidahisha nyuma yo gusarurwa), igihe nyacyo cyo gusarura ikiribwa gisaba guhuza n'ibyo isoko rikeneye kuricyo, ni ukuvuga nk'urusenda n'imiteja. Naho ku bihingwa bigira icyo gihe cyo gusohora Etilene nyinshi bikanahumeka cyane mbere yo gutangira kwangirika (Bihisha nyuma yo gusarurwa) nka avoka, imyembe, igihe cyo gusarura kibaho mbere gato y'uko kigera kuri rwa rugero rukenewe ku isoko kugirango igihe kizagerera ku isoko abe aribwo kizaba kigeze kuri rwa rugero rusabwa.

Ubwoko bwo kugeza igihe cyo kwera:

- Igihe cyo kwera ukurikije imikurire y'igihingwa (Physiology);
- Igihe cyiza cyo kuribwa cyangwa kwera kw'imbutu n'imboga (Consumer or horticulture maturity)

#### 5.1.1 Igihe cyo kwera ukurikije imikurire y'igihingwa (Physiological maturity)

Bivuga igihe igihingwa cyarangije gukura rwose mbere gato y'uko imbutu zitangira guhisha cyangwa gutanga umurama ku bihingwa by'imbutu bitagera igihe ngo bisohore Etilene nyinshi maze bigire guhumeka kuri ku rwego rwo hejuru mbere yo kwangirika (Bidahisha nyuma yo gusarurwa).

#### 5.1.2 Igihe cyo kwera mu rwego rw'ubucuruzi cyangwa kwera kw'imbutu n'imboga

Igihe cyo kwera kw'igihingwa ku kigero runaka cy'ubukure giterwa n'icyo ugamiye kuzakoresha umusaruro wacyo. Kwera kw'imboga n'imbutu kurimo ibice bitatu bitandukanye:

#### Kutageza igihe cyo kwera ukurikije imikurire y'igihingwa isanzwe

Imboga zisarurwa mu gihe zicyorohereye, zikiri ibitokatoke zitaragira n'imizi myinshi mo imbere nk'imiteja, Okra na Karoti.

Ishusho ya 36 Imboga ziri mu bihingwa bidahisha nyuma yo gusarurwa: Ibigori by'abana, Amashaza, okra, imiteja na runner beans



Okra



Imiteja



Ibigori by'abana



Runner beans

### Kwera neza

Imbuto n'imboga bisarurwa hari ibintu bimwe na bimwe byagezweho nk'ishusho yabyo cyangwa ubunini.

Ishusho ya 37 Imbuto zikuze kandi zeze neza ziri mu bwoko bw'ibihingwa bihisha nyuma yo gusarurwa



Imineke



Imembe



Amatunda



Amapapayi

### Gusarurwa bihishije neza

Kwera kw'imbuto ziri mu rwego rw'ibihingwa bihisha nyuma yo gusarurwa kugendana n'igihe zahishirije, ni ukuvuga Pomme, inanasi, amaronji.

Ishusho ya 38 Imbuto zo mu rwego rw'ibihingwa bitagera igihe ngo bisohore Etilene nyinshi maze binagire guhumeka kuri ku rwego rwo hejuru cyane zisarurwa zihishishije



Umuzabibu



Indimu



Inanasi



Inkeri

## 5.2 Gupima ukwera kw'igihingwa (Igipimo cyo kwera)

Ukwera kw'igihingwa kumenywa hagendewe ku kigereranyo cyangwa gushyira mu gaciro kwa buri muntu. Abahinzi benshi bafata icyemezo cyo gusarura bashingiye ku kurebeshya amaso cyangwa gusarura bike mu murima bakabanza bakumva uko bimeze mbere yo gusarura kwa nyako. Ubu buryo bwo kumenya ibyo usarura bwitwa ko bushingiye ku byiyumviro, bukaba bugengwa n'ubushobozi bw'usarura mu gufata ibyemezo.

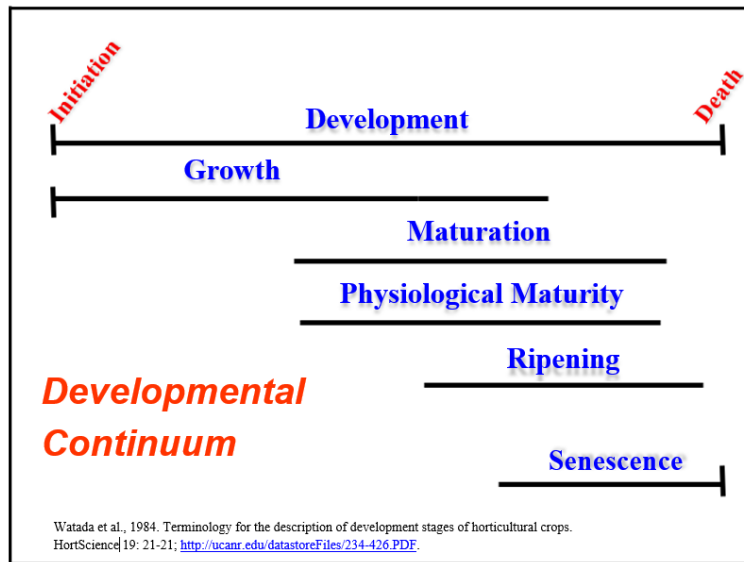
### 5.2.1 Gukoresha tekinike zishingiye ku ntego no gukoresha tekinike zishingiye ku marangamutima

- Impumuro cyagwa uburyohe ukoresheje kwihumuriza;
- Ubunini, ishusho n'ibara ukoresheje kureba;
- Imisusire, gukomera cyangwa korohera ukoresheje gukorakora;

- Gukubita imbuto ukumva ijwi bitanga ukoresheje ukwirangira;
- Kuryaho kugirango wumve uko ziryohereye, uko zikereta cyangwa zirura.

Uburambe bukwiye nibwo muyobora wa mbere mu gusesengura ukoresheje amaso. Igihe nyacyo cyo gusarura kurebeshwa amaso ku bihingwa bimwe na bimwe: Ku bitunguru by'amateke ni igihe amababi yabyo n'igihe cyo hejuru y'ubutaka cyamaze guhisha, ku birayi ni igihe igice cyo hejuru y'ubutaka cyamaze kuma/gupfa. Ibindi bihingwa bishobora kugorana, ibiranga imiteja yeze ahanini byo birebeshwa amaso.

Isusho ya 39 Igihe cyo kwera mu mikurire y'imbuto zimwe na zimwe n'imboga



Inkomoko: Watada et al 1984

### 5.2.2 Ibibi byo gukoresha tekinike zishingiye ku marangamutima

- Imihindagurikire y'ikirere ishobora kuvangira abasaruzi;
- Guhindagurika kw'ibintu bimwe bituruka ku bifite ubuzima (biotic) cyangwa ibidafite ubuzima (abiotic) cyangwa agace ibihingwa birimo bishobora kukuyobya mu gufata ibyemezo ku gihingwa (ibihingwa biri hafi y'icyobo cy'amazi cyangwa hafi y'ibyobo cy'ifumbire bikura vuba vuba);
- Mu buhinzi bugamije ubucuruzi (imirima minini), gushyiraho agace gato uzagenzuriramo ko ibihingwa bigeze igihe cyo gusarurwa kizanze kugorana ubwo rero imwe mu misogwe iba ishobora gusigara mu murima ikaba igihombo mu isarura rikurikiraho kuko hari igihe usanga yararengeje igihe cyo gusarurwa.

Mu bundi buryo bwo kumenya igihe nyacyo cyo gusarura harimo: Gukoresha uburyo bwo kubara, Gukoresha uburyo bw'ibifatika, no gukoresha ibinyabutabire.

Mu buhinzi bw'imateja, ibinyabutabire (Urugero rw'amavuta, umutobe n'isukari) ndetse n'uburyo bwo kubara mu kumenya ko igihingwa cyeze ntibukunze gukoreshwa, mu gihe uburyo bukoreshwa ibifatika ari bwo bufite agaciro cyane ku basaruzi bukaba bushobora gufasha abasaruzi kumenya igihe nyacyo cyo gusarura hagati y'igihe cyo kwera ndetse n'igihe biba biteze neza.

#### Uburyo bukoresha ibintu bifatika

Hariho uburyo bwinshi bukoresha ibigaragara mu kugenzura ukwera ku moko atandukanye y'imbuto n'imboga. Ubwo buryo ni: Imbaraga zifatisha urubuto ku nkondo yarwo, gusuzuma ijwi ryazo, Guhindura ibara, uburyohe, kwifungura, guhunguka, ireme cyangwa isura ry'imbuto. Ku mboga, uburyo bwo kureba ibigaragara ku miteja harimo kureba ingano (Umurambararo n'uburebure bw'imateja), ugukomera/ukwifunga ku mashu binyuze mu kuyakanda.

## Uburyo bwangiza

Uburyo bwo kumenya ko imisogwe yeze ukoresheje uburyo bwo kuyangiza hazamo tekinike yo kuyikanda n'intoki cyangwa kuyikoraho.

Ibihingwa nk'amashaza, imiteja na okra bikandiwe hagati y'intoki (ishusho ya 39) mu kumenya uburyo bigitoshye, bifitanye isano n'ubukomere bw'imisogwe yasaruwe.

Ishusho ya 40 Tekiniki yo gukanda n'intoki cyangwa kuyikoraho



### 5.2.3 Igipimo cy'ubukure bw'imateja ku masoko atandukanye (Ubwongereza/lbisabwa mu muryango w'Ubumwe bw'Uburayi)

Ibirebwo mu kumenya imiteja yeze bigengwa n'isoko, kubera iyo mpamvu, amenshi mu masoko yo mu Muryango w'Ubumwe bw'Uburayi n'Ubwongereza yagabanyije imiteja mu byiciro bikurikira:

1. Imitēja mitoya cyane
2. Imitēja iringaniye
3. Imitēja minini

Ishusho ya 41 Ibiranga imiteja mitoya cyane, imiteja iringaniye n'imateja minini



#### 5.2.3.1 Ibiranga imiteja minini

Umurambararo w'imateja yo mu cyiciro cy'imini uri hagati ya mm5 kugera kuri mm 6.5, irate yabugenewe (ishusho ya 40) niyo ikoreshwa mu gupima umurambararo, gusa uburebure burahinduka bitewe n'ubwoko.

Imiteja minini ntiyihanganira ubushyuhe bitewe ni uko ingirangingo zayo ziba zitarakuze bihagije ugereranyije n'imateja mito bityo kugenzura ugutakaza amazi ni ingenzi cyane.

### 5.2.3.2 Ibiranga imiteja iringaniye

Imiteja iringaniye niyo ikunze kugaragara cyane iyo urebye ingano y'iyoherezwa mu mahanga muri buri cyiciro. Kuyitandukanya bishingira ku murambararo wayo uba uri hagati ya mm 7 na mm 8 mu gihe uburebure bwo buhinduka bitewe n'ubwoko bw'imateja mu gihe igeze igihe cyo gusarurwa. Rero, amoko amwe y'imateja atanga umusaruro mwiza nyuma yo gusarurwa iyo ubaze ingano y'ibijugunywa. Ku mpuzandengo y'uburebure ya cm 12 (kuva ku mutwe kugera ku mpera) kugera kuri cm 14 ukurikije amabwiriza akurikizwa mbere yo kuyifunga mu makarito nibwo bukenewe.

Ishusho ya 42 Imiteja iringaniye yashyizwe muri icyo cyiciro



Ishusho ya 43 Imiteja iringaniye iri mu ikureti



### 5.2.3.3 Ibiranga imiteja minini

Ugukenerwa kw'imateja minini mu Muryango w'Ubumwe bw'uburayi no mu Bwongereza kuri hasi cyane. Abaguzi b'imena ni abagurira ibigo binini. Imiteja minini ifatwa nk'imateja yarengeje ubukure ku murambararo uri hagati ya mm 8.5 na mm 12. Imiteja minini iba irimo imizi myinshi mu gishishwa bityo igafatwa nk'iyuzuyemo imizi myinshi cyane.



Ishusho ya 44 Ibiranga imiteja minini



Ishusho ya 45 Imiteja minini iri mu ikureti



Imiteja yarengaje ikigero cy'ubukure ni imwe mu byongera igihombo gitewe ni uko isoko ry'Umuryango w'Ubumwe bw'Uburayi n'ubwongereza ritayikunda. Niyo mpamvu, uretse gusa kuba ufite komande wahawe y'iyi miteja minini, ubundi wakagombye gusaura ushaka imiteja mitoya cyangwa iringaniye kugirango utagira ibihombo byinshi.

### 5.3 Ubwiza bw'imiteja bwemewe (Kurebesha amaso)-Uburambe, Isura, imisusire, uko icikamo, ibara, uburyohe n'impumuro

Ibisabwa n'isoko kuri buri cyiciro cy'imiteja (Imiteja mitoya, iringaniye, imiteja minini) bigengwa n'ibyo abaguzi cyangwa abayirya bashaka. Hari inyigo iri gukorwa ku bintu bigenga ibyo abaguzi bifuzwa, ariho hazamo ibintu bitandukanye byo kurebaho kuri buri cyiciro nk'uko bisobanuye hano hasi. Gupima uko umuteja ucimamo bikorehwa mu gupima ububisi bw'umuteja mu isoko hamwe n'inyigo zigaragaza isano ( $r=0.67$ ) iri hagati yo ku gucikamo (Ugukomera) no kurebesha amaso imisusire.

#### 5.3.1 Ibiranga imiteja urebesheje amaso

##### 5.3.1.1 Imiterere

Imiterere ni ikintu cy'ingenzi ku baguzi b'ibiriwa. Ni igipimo cy'ubunararibonye mu bijyanye n'ibiribwa kigasobanurwa nk'ikintu nyamukuru kibumbatiye uburyo bwo kumenya uburyohe ikiribwa cyagira mu kanwa umaze kukirya, gifite ibikiranga bisuzumwa ukoresheje gukorakora. Ku miteja, imisusire igenwa n'utugirangingo duto tuyigize, ibifite ubuzima n'ibinyabutabire biyirimo, amazi yifitemo n'ibigize igishishwa cy'ingirangingo ziyigize.

Imiterere iteye imbere ku miteja iringaniye ni umusaruro w'ibikorwa byo guhindura imiterere yayo mu imbere ugamije kuyiha ubushobozi bwo guhangana n'indwara mu gihe uri no kuyongerera imiterere yayo mu gihe itetswe (Pevicharova *et al.*, 2015).

##### 5.3.1.2 Ubutokatoke

Ubutokatoke ni igipimo kigaragaza uko byaba byoroshye kuvunagura imisogwe y'imiteja n'intoki igihe ari mibisi. Uko byoroha kuvunagura imisogwe ubwo ni nako iyo miteja iba itokatoshye. Ibi rero bifitanye isano n'urugero rw'ububisi bw'imiteja, uko imiteja ari mibisi cyane ni nako biba byoroshye kuyivunagura. Ijwi umuteja usohora iyo uwuvunnyemo rigenda rihindagurika uko umara igihe kinini mu bubiko cyangwa uko ugenda wegera kurangiza igihe cyawo cyo kubaho. Ubusanzwe imisogwe isaruwe hakiri kare itararenza igihe itanga ijwi ryumvikana cyane kurenza ya yindi yakuze cyane yegereje kurangiza igihe cyayo cyo kubaho.

##### 5.3.1.3 Isura/Ibara

Amoko yose y'imiteja agira ibara ry'icyatsi, icyakora imigaragarire n'ubukana bw'ibara bigenda bicuya uko ugenda wegera igihe cyo gusarura. Gusa hari ibindi bishobora gutera gucuya kw'ibara n'ubwo imiteja yaba itarakura cyane, muri byo harimo guhura na gazi ya etilene. Imiteja ihuye na gazi ya etilene igenda ifata ibara ry'umuhondo wijimye ku munsu wa gatatu w'uburambe ubwo bikazana impumuro mbi y'iyi miteja.

##### 5.3.1.4 Ukugira imizi

Ukugira imizi bivugaga ingano y'imizi iri mu musogwe. Ingano y'imizi ifitanye isano n'igihe igihingwa cyasaruriwe, ubwo rero imiteja minini iba ifite imizi myinshi ugereranyije n'imiteja mitoya cyane. Abahugurwa bagomba kumenya itandukanyirizo riri hagati y'imiterere no kugira imizi ukurikije uko imeze mu murima. Ni ingenzi kumenya ko hari amoko amwe y'imiteja agira imizi myinshi kurenza ubundi bwoko kandi bifite ikigero kimwe cy'imikurire. Iki ni ikintu cy'ingenzi ugomba kwitaho mu gutoranya ubwoko bukunzwe ku isoko.

Ubu buryo bwo kwitegereza burakoreshwa cyane mu kumenya uko imiteja imwe yaba ifite imizi kurenza iyindi muri buri bwoko bakoherejeho bikeya byo kureberaho.

### 5.3.1.5 Impumuro n'uburyohe

Impumuro isanzwe y'imateja ni impumuro nyarwatsi itagira impumuro itagira n'uburyohe runaka bw'umwimerere. Impumuro itari iy'umwimerere mu miteja ishobora guterwa no gukoresha amasabune cyangwa ibivanaho mikorobe bifite impumuro cyangwa gusarurira mu bintu byandujwe. Kwegereza imiteja ku bindi bihingwa bifite impumuro ikarishye nk'ibitunguru n'urusenda igihe kirekire (Hejuru y'amasaha 36) bigira ingaruka mbi kuko bihindura impumuro isanzwe y'imateja. Kubahiriza amabwiriza meza y'ubuhinzi bigomba gukurikizwa mu murima kugiango wirinde ikintu cyose cyazana impumuro idasanzwe mu byasaruwe.

## 5.4 Ibikoresho byifashishwa mu gupima ubwiza (Gukoresha ibipimo cyo kwera-Ingano, Igipimo cy'isukari)

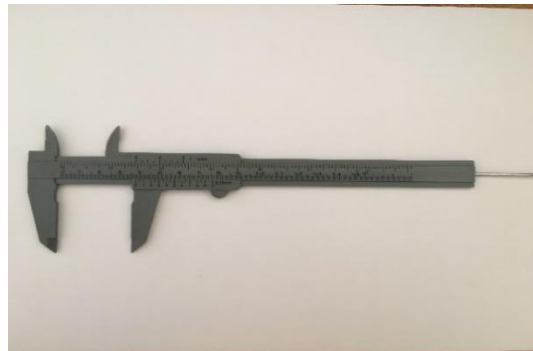
Mu gihe hatari ibikoresho, tekunike zimwe zirakoreshwa mu gupima ubushyashya bw'ikiribwa harimo gukandira ikiribwa hagati y'intoki. Gukandira ikiribwa mu ntoki bigufasha kumenya niba ikiribwa ari kibisi kandi cyoroshye, mu gihe imiteja yatakaje amazi itavunagurika neza ahubwo ikizinga cyangwa se igacikamo isohora ijwi rikakakaye.

Ibikoresho bikoreshwa mu gupima uko imiteja yeze harimo irate yabugenewe idahenze ifite ubushobozi bwo gupima umurambararo kuva kuri mm 5 kugera kuri mm 12 (ishusho ya 46). Mu gihe agakoresho kimwe "Vanier calliper" kagaragara mu ishusho ya 47 gapima urugero rw'isukari iri mu miteja n'ubwo kadakoreshwa cyane.

Ishusho ya 46 Irati yabugenewe



Ishusho ya 47 Vanier calliper



Ishusho ya 48 Terimometere yiyandikamo imibare



Ishusho ya 49 Umunzani



## 5.5 Uburyo na Tekinike zo gusarura (Amabwiriza yo gusarura)

Gusarura imiteja bikoreshwa intoki mu bihugu bikiri mu nzira y'amajyambere, n'ubwo gukoresha amamashini nabyo bishobora gukoreshwa mu buryo buteye imbere. Abasaruzi bagomba kwigishwa uburyo bukwiye bwo gusarura, harimo na tekuniki zigabanya ibihombo cyangwa ibyangirika.

Kugirango ugabanye ibyangirika mu gihe usarura, abayobozi b'amakioe asarura bagomba guhitamo agapande k'umurima berekaniraho imiteja yujuje ibyo isoko rikeneye. Ni byiza gusarura mu masaha ya mugitondo mu gihe ubushyuhe buba bukiri hasi.

Nk'ihame, nta gapande k'umurima kagomba gusarurwa hadatanzwe uburenganzira bwo kugasarura kandi bikemezwa n'umugoronome cyangwa umuyobozi mukuru ko ako gapande gafite ubuziranenge ukurikije igihe katerewe imiti.

Intego nyamukuru y'amabwiriza yo gusarura ni ukugirango wizere ko umusaruro ujyanye ku nzu ubikwamo ukanatunganyirizwamo wujuje ubuziranenge, uzira ubwandu kandi wujjwe ubwiza busabwa n'abakiriya.

### 5.5.1 Ibigize amabwiriza yo gusarura

#### 5.5.1.1 Amabwiriza y'isuku ku bakozi agomba kwitabwaho mbere yo gusarura:

- Nta muntu n'umwe urwaye indwara zandura nk'impiswi, kuruka, iseseme cyangwa igikomere kigaragara ugomba kwemererwa gukora imirimo yo gusarura kugeza igihe azaba amaze kuvurwa. icyemezo cya muganga ni ngombwa igihe agarutse mu kazi kugirango yerekane ko ameze neza kandi nibura amasaha 48 nyuma y'ibimenyetso bya nyuma mu gihe umukozi yari afite imiswi cyangwa kuruka. Iyo hari umukozi urwariye mu kazi, agomba guhita abimenyeshya umukuriye mu kazi ako kanya.
- Imisatsi igomba kuba ipfutse n'ingofero cyangwa igitambaro cyabugenewe. Imyenda abakozi bambaye igomba kuba ifite isuku kandi ikeye iteka ryose.
- Inzara zigomba kuba zifite isuku. Nta bintu bisigwa ku nzara cyangwa imibavu ihumura abakozi basarura bagomba kwishyiraho. Nta biryo niyo bwaba ubunyobwa cyangwa ibinyamakuru bigomba kugera mu murima mu gihe cyo gusarura.
- Telefone zigendanwa zigomba gusigwa ahantu zikarindwa n'umukozi uba abishinzwe mu kwirinda ko zagwa hazi cyangwa zikameneka mu gihe uri gutunganya umusaruro. Mbere y'uko igikorwa cyo gusarura gitangira, buri wese agomba gukaraba ibiganza akoresheje amazi meza. Karaba ibiganza buri gihe uvuye mu bwihereho. Amasabune adafite impumuro niyo yonyine agomba gutangwa kandi niyo agomba gukoreshwa.

Mu gihe habayeho kumeneka kw'amavuta, kumeneka kw'ikirahuri cyangwa ikindi kintu cya palasitike gikomeye, abasaruzi bagomba guhita babimenyeshya ubakuriye mu kazi, aho hantu hagomba kuba hashyizwe mu kato ntihagire indi mirimo yo gusarura ihakorera. Gushakisha ibimene by'ibirahuri bigomba gukorwa kugeza igihe utumene twose tumaze kuboneka tugakurwamo. Mu gihe hari amavuta cyangwa mazutu imenetse, ibyasaruwe bigomba kugenzurwa hanyuma ibyandujwe bikavanwamo. Umusaruro uwo ariwo wose uvuye mu gapande byabayemo ugomba kujugunywa kubera uba wamaze kwandura, icyo kibazo cyabaye kandi kiba kigomba kwandikwa hakanagaragazwa ingamba zafashwe n'ibyakozwe.

- Igikomere kigomba gupfukwa n'igipfuko cyabugenewe. Mu gihe uwakomeretse yemerewe gukomeza gukora agomba kujyanwa mu rindi shami aho atari bukore ku musaruro.
- Kunywa itabi ntibyemewe kereka iyo ubikoreye ahantu hagenewe kurinywera.
- Abasaruzi bagomba kubahiriza amabwiriza ya sosiyete ku bigendanye n'imiringa n'ibindi by'umurimo byambwarwa ku maboko n'ahandi. Kwambara amasaha, amaherena, udushinge cyangwa ibindi bintu by'umurimo bitobora mu mubiri ntibyemewe. Ntibyemewe kurira ibiryo mu murima cyangwa aho bari gusarurira.

#### 5.5.2 Amakureti asarurirwamo/Imifuka yemewe/ibitebo/ibyuma (Ibyo basaruriramo n'ibikoreso)

Mbere y'uko bikoreshwa, ibitebo bisarurirwamo n'amakureti bigomba gusukurwa. Bigomba kwinkwa, bikozwa hakoreshejwe amasabune yabugenewe, bikunyuguzwan'amazi meza. Ntinigomba guhita biterekwa hasi ku butaka ahubwo bigomba guterekwa ku tuntu duterekwaho amakureti cyangwa ku ma paleti.

Ishusho ya 50 Umusaruro wasaruwe ugahita ushyirwa ku butaka



Ishusho ya 51 Gukoresha utuntu twagenewe kurambikaho amakureti cyangwa ikindi kintu gifite isuku cyo kurambikaho amakureti arimo umusaruro



Amakureti ntabwo agomba gupakirwa ngo yuzuzwe no hejuru kugirango wirinde ko umusaruro wangirika ndetse n'umwuka ubashe gutambuka neza. Gushyira mu byiciro bigomba gukorerwa ku murima, buri cyiciro kigashyirwa mu makureti yacyo kitavanze n'ikindi. Ibyuma bigomba gutyazwa kugirango wirinde ko byakwangiza umusaruro hanyuma nijoro bikabikwa mu miti yica mikorobe mu rwego rw'isuku wirindwa ko hari icyaza kubyanduza.

Ishusho ya 52 Uburyo bwemewe bwo gupakira mu ikureti utarengeje ibiro 16



Ishusho ya 53 Uburyo butemewe bwo gupakira mu ikureti (Ikureti ipakiye cyane) hejuru y'ibiro 20



Umusaruro wamaze gusarurwa ntugomba gushyirwa ku zuba, byiyongeyeho kandi umusaruro wasaruwe ugomba kubikwa mu cyumba gikonjesha gikoresha amakara, kuri paleti mu gihe ugitegereje kuwugeza ku nzu yo gutunganyirizamo umusaruro mbere y'uko woherezwa mu mahanga (Pack house).

Ishusho ya 54 Twikira umusaruro uwurinda kwangizwa n'ubushyuhe cyangwa izuba ryinshi nyuma yo gusarura



Ishusho ya 55 Ntugashyire umusaruro wamaze gusarura ku zuba



Ku mugoroba, amakureti yose n'udutebo dusarurirwamo bigomba gukusanywa bikavanwa mu murima, bigasukurwa bikabikwa ahagenewe gutunganyiriza amakureti wirinda ko inyoni, imbeba cyangwa udukoko byayanduza, kugirango bizabe byiteguye gukoreshwa umunsi ukurikiyeho.

Ntukarambika na rimwe ku butaka ibyuma cyangwa ibindi bikoreso byo gusarura mu gihe bitari gukoreshwa.

#### 5.5.2.1 Umusaruro uriho igitaka

Umusaruro uriho igitaka wavanye mu murima ugomba kozwa ndetse byashoboka hagakoreshwa amazi arimo kolorine nk'uko amabwiriza abisaba, hanyuma ukarobanurwa n'abakozi bo ku nzu yagenewe gutunganyirizwamo umusaruro no kuwupakiriramo woherezwa mu mahanga.

#### 5.5.3 Ubwoko bw'ibikoresho n'uko bigomba gufatwa mbere n nyuma yo gusarura

Ubwoko bwinshi bw'ibikoresho bikoreshwa mu gusarura ndetse na nyuma yo gusarura, hagamijwe kugabanya ibyangirika cyangwa ibijugunywa, kwirinda kwandura no gutuma umusaruro ukonja igihe kirekire ndetse no kurinda abakozi impanuka. Bimwe muri ibyo bikoresho harimo:

- Imifuka isarurirwamo;
- Amakureti;
- Palete cyangwa utuntu amakureti aterekwaho;
- Kandagira ukarabe irimo amazi meza yo gukaraba ibiganza.

Ibikoresho byose byakoreshejwe mu gusarura bigomba gusukurwa ndetse no gusanwa mbere yo kongera gukoreshwa, ibikoresho bigomba gusuzumwa, ndetse mu gihe bitameze neza ukareba ikintu cyaba cyabyanduje.

Ibikoresho bisarurirwamo nk'amakureti bigomba gusuzumwa niba bitaramenetse kandi bigasanwa mu buyo bitari buteze ikibazo cyo kwanduza umusaruro. Ibikoresho bikoze mu biti ntabwo ari byiza kubibikamo mu rwego rwo kwirinda ibibazo bishobora guterwa n'utubango tw'ibyo bikoresho (Kwandura gutewe n'ikindi kintu giturutse ahandi).

Ishusho ya 56 Ifoto ya Kureti yangiritse yasanwe mu nguni



Ishusho ya 57 Gushyira umusaruro mu bindi bikoresho. Kureti ya Jambo ikoresha mu gutwara urusenda ntabwo ari nziza ku miteja bitewe n'ibibazo itera mu kuyikonjesha



Ishusho ya 58 Ikureti isukuye yujuje ibisabwa ikwiriye gukoreshwa mu gusarura miteja



Ishusho ya 59 Amakureti yanduye ntabwo gukoreshwa mu gusarura



Ibikoresho byo gusarura byasukuye mu gihe bitari gukoreshwa bigomba kubikwa ahantu hafunze hatagera inyoni cyangwa imbeba cyane cyane mu ijoro cyangwa mu mpera z'icyumweru (weekend). Gusuzuma niba nta mahurunguru y'inyoni cyangwa imbeba yagiyeho mbere yo kubikoresha ni ngombwa cyane.

#### 5.5.3.1 Ibikorwa remezo bikenewe mu gihe cyo gusarura

Umusaruro wasaruke ugomba gushyirwa ahantu hakonje ukimara gusarurwa. Ku murima, abahinzi bagomba kubaka ibintu bitanga igicucu bakoresheje ibikoresho bidahenze cyangwa ububiko bw'agateganyo bushyirwamo umusaruro mu gihe ugitegereje kuwohereza aho ushyirirwa mu byiciro no kuwutoranya mu nzu bikorerwamo.

Mu bikorwa remezo by'ingenzi, umuntu yavugamo:

- Ibyumba bikonjesha bidakoresha imbaraga z'amashanyarazi;
- Ibisharagati cyangwa hangar bishyirwamo umusaruro uwurinda izuba;
- Aho gukarabira ibiganza.

Mu gihe utwara umusaruro uwuvana mu gapande uri gusaruramo uwujyana mu gisharagati cyangwa muri hangari ahatwikiriye, ni byiza kugenzura utuyira cyangwa uduhanda tuyyayo kugirango ugabanye iyangirika ryaterwa no kubimena hasi, gukomereka inyuma ku bishishwa bitewe no kwicugusa.

Ishusho ya 60 icyumba gikonjesha gikoresheje amakara



Ishusho ya 61 Hangari yo kurobanuriramo umusaruro uwushyira mu mu byiciro ariko itujuje ibisabwa



Ishusho ya 62 Hangari ya kijyambere yo ku murima yo kurobanuriramo umusaruro ushyirwa mu byiciro



ho ugabanya ubushyuhe bw'umusaruro nko guhumeka, kongera uburambe bwawo, bikabungabunga ubwiza bw'umusaruro, mu gihe kandi unabuza gutakaza uburemere butakara binyuze mu gutakaza amazi no kubora.

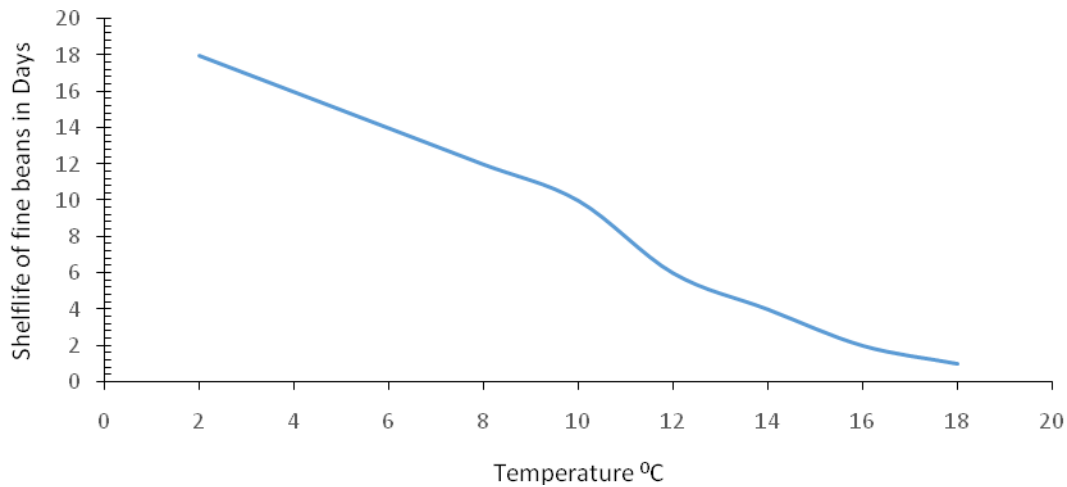
Ibigize ugukonjesha bwa mbere cyangwa guhoza (Pre-cooling system) harimo icyuma gikonjesha gake gake, umwuka ukonje uzana imbaraga, gukonjesha gukoresha amazi, Gukonjesha ukoresheje umwuka wakuruye ndetse no guhuza umusaruro n'ibintu bikonje cyane nka balafu.

Gucunga ubushyuhe ni ikintu cy'ingenzi cyane mu kurinda ubwiza bw'imiteja nyuma yo kuyisarura. Ubushyuhe bw'umusaruro buba buri hejuru y'ubushyuhe buri mu kirere urimo ho dogere selisiyusi 3 kandi bugumya buzamuka iyo nta gikozwe. Ibi rero bitera kwangirika kw'ubwiza bwa cya kiribwa, kugabanyuka kw'igihe cy'uburambe, kwiyongera kw'utunyabuzima duto no gutakaza uburemere.

Tekinike zoroheje zishobora gukoreshwa mu kugabanya ubushyuhe bw'ikiribwa kandi ni byiza gukoresha Tekinike ya kobaliti, gukoresha ibyuma bikonjesha bidakoresheje ingufu z'amashanyarazi, ibisharagati/ibidari cyangwa hangari zoroheje zikozwe mu bintu bibuza ubukana bw'izuba kugera ku musaruro.

Ishusho ya 63 irerekana ingaruka z'ubushyuhe ku burambe bw'imiteja, imiteja igira uburambe iyo ubushyuhe bugumishijwe hasi (hagati ya Dogere 4 na dogere 8), mu gihe uburambe bugabanyuka kugeza ku munsu umwe iyo ubushyuhe buzamutse hejuru ya dogere 18.

Ishusho ya 63 Igishushanyo kigaragaza ingaruka z'ubushyuhe mu kugabanya uburambe bw'imateja



### 5.5.5 Koza imiteja mu gihe cy'imvura

Imiteja igomba gupakirwa mu makarito mu buryo bwujuje ubuziranenge, mbere yo kuyipakira igomba kozwa mu gihe yaba yaragiyeho ibitaka mu gihe cyo kuyisarura. Koza imiteja byongera ibihombo bitewe no gukoboka mu gihe uhanagura ibitaka ku misogwe. Ni ngombwa gukoresha ubundi buryo nko kudasarura imvura ikimara kugwa, kutavomerera ukoresheje imipira kugirango ugabanye ubuhehere no kuba ibitaka byatarukira ku migogwe bigafataho.

Mu gihe hafashwe icyemezo cyo koza imiteja, ugomba gukoresha amazi meza. Intungagihingwa zirimo ibyica mikorobe zishobora gukoreshwa wubahirije urugero rusabwa kugirango ugabanye kwanduzwa na mikorobe. Zimwe muri mikorobe zigomba kurebwaho harimo uruhumbu cyangwa uduhumyo tw'umweru, Akaribata no kubora.

### 5.5.6 Ingamba na Tekinike zo kugabanya iyangirika cyangwa ibihombo by'umusaruro

#### **Sarura mu buryo buhoraho imiteja igejeje igihe kugirango ugabanye imiteja yashobora kurengerana**

Amoko yose y'imateja ari mu bwoko bw'ibihingwa bikura vuba cyane ku mpuzandengo ya cm 0.1 mu burebure buri saha iyo ibisabwa ngo ikure neza bihari. Ukurikije uyu muvuduko w'ubukure, ni ngombwa gusarura inshuro nyinshi kugirango wizere ko imiteja wayisaruye yubahirije ibyo abakiriya bashaka. Ibi kandi bizagabanya ibihombo bituruka ku kutuzuzwa ubwiza busaba buterwa n'imateja yakuze cyane ikarenza igihe nyacyo cyo kuyisarura. Igenzura rikaze mu gihe cyo gusarura ni ngombwa kugirango wizere ko nta musogwe n'umwe ugeze igihe cyo gusarurwa usigaye mu murima.

#### **Gukoresha ibikoresho byo gusarura bifite isuku birakenewe kugirango wirinde ikwirakwira ry'indwara**

Ibikoresho byo gusarura bishobora kuba umuyoboro w'ikwirakwizwa ry'indwara mu muzigo ugiye koherezwa mu mahanga. Abahinzi bagomba kugenzura ko ibikoresho byose bikoreshwa mu gusarura bisukuwe neza nyuma yo kubikoresha. Ibikoresho byo gusarura bigomba kubikwa ahantu hafunzwe kandi hafite umutekano mu gihe cy'ijoro kugirango ugabanye ukwanduzwa kwaterwa n'amahurunguru y'imbeba n'inyoni.

#### **Irinde guhutaza cyangwa guhubuka mu gihe utunganya umusaruro**

Ukurikije ukuntu imiteja iba yorohereye cyane, kugabanya inshuro ukorakora ku musaruro ni ipfundo ryo kongera uburambe bwayo, kugabanya ibihombo ndetse no kongera umusaruro. Ibikorwa by'ingenzi nibyo gusa bigomba gukorwa ku musaruro. Ibihombo byinshi bibonekera mu nzu itunganyirizwamo umusaruro bitewe n'ibikorwa byinshi biwukorerwaho, mu gihe umusaruro uvanywe mu murima ibyiciro bivangavanze



mu makureti. Niyo mpamvu ari ngombwa kuvangura bya byiciro bitatu by'imateja mu gihe usarura kugirango ugabanye ikorakorwa ry'umusaruro mu gihe cyo kuwutoranya no kuwushyira mu byiciro.

Gukora mu miteja bigomba gukoranwa ubwitonzi. Ubuyobozi bwakagombye gutanga ibikoresho bimeze neza hagamijwe gutuma ikusanya ry'umusaruro haba mu murima cyangwa mu mahangari utoranyirizwamo rikorwa nta nkomyi. Muri byo harimo amakureti, za makuzungu, amakarito n'ibindi.

### **Mu gupakira umusaruro mu makureti ntugomba kuyitsindagiramo kugirango umwuka ubashe gutemberamo**

Nk'uko twabivuze muri iki gice, ibikomere biterwa no gutsindagira umusaruro akenshi ntibiba bigaragara n'amaso, ahubwo bigaragara mu gihe cyo gushyira mu byiciro aho imiteja myinshi ivanwamo ikajugunywa cyangwa igashyirwa mu cyiciro cya kabiri. Gutsindagira cyane, kuzuza amakureti cyane ukarenza, gukoresha amakureti ya jumbo (Ishusho ya 57) ntibituma umwuka utembera mu miteja hagahita haba ahantu bagiteri ziba ahatari umwuka zororokera bigatera kubora ku musaruro wangiritseho cyangwa wakomeretse.

### **Guhitamo imisogwe igejeje igihe mu gusarura, ukareka itarageza igihe ikazasarurwa ubutaha**

Imisogwe itari yera inamba vuba vuba ugereranyije n'iyenda kwera cyangwa yeze neza. Imyinshi mu miteja iteze (munsi ya mm 6 z'umurambararo) ivanwa mu yindi ikanajugunywa kuko iba itujuje ibyo abakiriya bakeneye. Imisogwe igira uburemere buke bityo umusaruro ukagabanyuka ugereranyije n'uba uteganyijwe wa Toni 15/ha. Amahugurwa akwiriye ku ikipe isarura ajyanye n'ibyo isoko rikeneye aba akenewe cyane.

### **Panga gusarura mu gitondo mu gihe ikime cyose cyamaze gukamuka mu bihingwa**

Imwe mu mpamvu nyamukuru zitera ibihombo ni ibintu bishobora gufata ku misogwe, akenshi aba ari igitaka cyabaye icyondo bigatuma ukenera kuronga umusaruro. Imiteja yaronzwe igira umusaruro muke ugereranyije n'imateja itaronzwe. Kubora bibaho cyane mu miteja yaronzwe bitewe n'izamuka ry'ubuherehere (impamvu zituruka ku bidafite ubuzima) hakaba ahantu hatiza umurindi gukura kwa za mikorobe. Ni byiza rero gusarura imiteja ku gasusuruko cya gihe ikime cyose kiba cyamaze gutumuka bikagabanya gukenera kuronga.

### **Umusaruro ugomba guhita uwuvana ku zuba ukimara kuwusarura**

Imiteja yamaze gukurwa ku giti yari ifasheho itangira kuraba cyangwa igata amazi ako kanya bitewe n'imikorere y'ubuzima bwawo mo imbere twasobanuye neza mu gice cya 4. Kugirango ukerereze igikorwa cyo guhumeka no gututubikana, imiteja iba igomba gushyirwa ahantu hafutse ako kanya ukimara gusarurwa, ku bukonje buri hagati ya dogere 12 na dogere 10. Kubaka ibisharagati byo gushyiramo umusaruro ni ngombwa kandi bikaba byegereye bishoboka agapande k'umurima kari gusarurwa kandi n'imihanda imeze neza kugirango bifashe kuwutwara uyanwa ku byumba bikonjesha bidakoresheje ingufu z'amashanyarazi cyangwa aho ipakirirwa.

### **Gushyira mu byiciro bigomba gukorwa uvvanamo imiteja yangijwe n'ibyonnyi, iyakomeretse ndetse n'ifite ubusembwa.**

Imwe mu mpamvu zitera ibihombo ku musaruro ni ukuba mu miteja yasaruwe harimo uburwayi. Bagiteri nyinshi, uduhumyo n'inzoka zimwe zifite ubushobozi bwo gukomeza kubaho ku bukonje bwo hasi cyane cyane iyo zitari zasambura. Kugirango ugabanye ukwiyongera kw'indwara mu bihingwa byarwaye, imisogwe yarwaye n'ifite ubusembwa igomba guhita ikurwa mu musaruro wasaruwe. Muri mikorobe zikunze kwangiza harimo Akaribata (*Colletotrichum lindemuthianum*) n'uruhumbu cyangwa uduhumyo tw'ikigina n'umweru (*Sclerotinia sclerotiorum*).

### **Gupanga kubusanya igihe cyo guhinga ukurikije imihindagurikire y'ikirere**

Mu Rwanda, imiteja yera igihe cyose cy'umwaka haba mu gihe hari imvura cyangwa wakoresheje kuvomerera. Mu cyi, uguhinduka kw'ikirere uva mu gihe cy'imvura ujya mu gihe cy'izuba bishobora gutera ibihombo. Abahinzi bagirwa inama yo gutera imiti yo gukingira (Switch, Luna sensation n'iyindi) ku miteja,

hagati y'igihe cy'izuba n'itangira ry'igihe cy'imvura. Ubundi buryo bujyane n'imihingire, nko gushyiraho uburyo bwo gukamura amazi byafasha kugabanya imyuzure mu dupande duhinzemo imiteja.

## IGICE CYA 6: AMABWIRIZA YO KUBIKA UMUSARURO W'IMBOGA, IMBUTO N'INDABO

### Ingingo nkuru zitaweho muri iki gice:

- Abasomyi baravanamo ubumenyi ku bisabwa mu kubika no kubungabunga umusaruro w'ibiribwa bibisi, uburyo butandukanye n'ahantu hatandukanye ho kubika umusaruro ndetse n'ingaruka zaturuka mu kutubahiriza ibisabwa.
- Ikiguzi ndetse n'inyungu ziri mu gukoresha ububiko buteye imbere.

### 6.1. Kubika Umusaruro

Kubika imiteja yasaruwe ni ikintu cy'ingenzi kugirango ubone ubwiza bukenewe n'isoko. Imbaraga zigomba gushyirwamo kugirango wizere ko uburyo bwo kubika umusaruro buboneye kandi butabasha guteza ukundi kwangirika kw'umusaruro. Muri rusange, ubushyuhe, Etilene ndetse n'ubuhehere bw'umwuka ukikije aho umusaruro uri nibyo bintu by'ingenzi byo kwitaho kuko bigira uruhare mu kubungabunga ubwiza bw'ikiribwa mu ghe cyacyo cyose cyo kubaho

Impamvu ugomba kubika umusaruro w'imateja mu byuma cyangwa ibyumba bikonjesha:

- Kugirango bimare igihe;
- Kugirango ubungabunge ubwiza bw'intungamubiri zirimo;
- Kugirango ugabanye ibihombo biterwa n'umusaruro ujugunywa kuko wangiritse;
- Kugirango haboneke umusaruro wo kurya ndetse no gutunganya wujuje ibyo isoko risaba;
- Kugirango wongere igihe umusaruro umara utari wangirika.

Imiteja ibitswe ku bushyuhe bukwiye bwa dogere 5 kugeza kuri dogere 7 ndetse n'ubuhehere bw'umwuka bwa 70% kugeza kuri 80% yongera uburambe ku rwego ruri hejuru hagati y'iminsi 12 n'iminsi 14 itari yangirika. Ubwitonzi bwo ku rwego rwo hejuru buba bukenewe kugirango wizere ko ubwiganze bw'umwuka uyu duhumeka, Karubone irimo amazi na Etilene mu kirere cy'aho ubika umusaruro, buba buri ku rugero rwemewe rwa 2-3% na 5 -6%. Kugirango ubungabunge uburambe bw'umusaruro, ni byiza kwirinda kuvanga imiteja n'undi musaruro w'ibihingwa bisohora etilene nyinshi nk'imineke, marakuja, urusenda, avoka n'inyanya.

Iyo mu bubiko uvanze imiteja n'ibindi biribwa bimwe na bimwe bishobora gutuma ibara ry'imateja rihinduka bigatera gucuya kwayo. Kuvangura ubwoko butandukanye bw'umusaruro w'ibiribwa ni ihame ntakuka kugirango wirinde ko imiteja itakaza ibara ryayo ry'umwimerere igacuya.

Bitewe n'imbaraga z'isoko, imiteja ibikwa ukurikije uko isoko riteye, uko igenda igurishwa biterwa n'uko igenda ikenerwa ku isoko, bityo rero ahantu hakwiye hujuje ibisabwa haba hakenewe (Ububiko) kugirango urinde imiteja impamvu zose zayangiza mu gihe itegereje kugurishwa.

#### 6.1.1 Ibintu by'ingenzi bigenga ibikwa ry'umusaruro w'ibiribwa bibisi

- Ukwera kw'ikiribwa igihe cyo kugisarura;
- Uburyo wakoresha mu gusarura;
- Impamvu zibaho mbere yo gusarura;
- Isiku n'isukura ry'ahagenewe kubikwa umusaruro;
- Ibikorera umusaruro ukiri mu murima mbere yo gusarura;
- Uko uranganiza ubushyuhe;
- Ubuhehere bw'umwuka w'aho ubika umusaruro.

Ubushyuhe n'ubuhehere bw'umwuka w'aho ubika umusaruro ni ibintu bw'ingenzi byo kwitabwaho mu kugena uko ubika umusaruro ariko ukurikije ibisabwa na buri bwoko bw'umusaruro nk'uko ari ngombwa kugerageza kogerera umburambe bwawo.

Hariho Tekinoloji zitandukanye zihendutse zikoreshwa mu kubika umusaruro:

- Uburyo bwa gakondo kandi buhendutse bukorwa ukoze ikirundo bukoreshwa cyane mu binyabijumba, kubika mu bigega ku binyamateke byumye, kubika mu mucanga cyangwa muri gasenyi iva mu bishishwa by'imbutu z'imikindo, bikorerwa kuri site cyangwa ku murima nk'uburyo bwa gakondo cyangwa uburyo bukorerwa ku murima.
- Ibyumba bikonjesha bidakoresha ingufu z'amashanyarazi ahubwo bikoresha amakara: mu kubyubaka hakoreshwa ibikoresho biboneka hafi aho kandi bihendutse kandi bikubakwa ku murima kugirango bibikwemo umusaruro mu ijoro kandi ku bushyuhe bwo hasi bityo uburambe bw'umusaruro bukabungwabungwa.

Imbonerahamwe ya 9 Ibisabwa ahabikwa imiteja kuri buri rwego rw'uruhererekane nyongeragaciro rwayo

Urwego rwo kubikaho imiteja	Ibisabwa mu bubiko					Uwo bireba
	Ubuhehere bw'umwuka (%)	Ubushyuhe °C	Etilene	Impamvu yo kubika umusaruro	Ukubungwabungwa gusabwa	
Ibisharagati byo ku murima	70	12-15°C	Zeru	Utegereje kuwujyana aho ushyirirwa mu byiciro	Ku rugero rwo hasi	Umuhinzi
Ibyumba bikonjesha bidakoresha ingufu z'amashanyarazi	75	9-12°C	Zeru	Utegereje ko uwohereza mu mahanga aza kuwufata	Ku rugero rwo hasi	Umuhinzi
Mu gisharagati gikorwamo gushyira mu byiciro	75	10°C	Zeru	Utegereje kuwutwara	Ku rugero ruringaniye	Umuhinzi
Inzu zitunganyirizwamo umusaruro ugiye koherezwa mu mahanga	80	5-7°C	Zeru	Icyo isoko risaba, igihe indege iri bugendere	Ku rugero rwo hejuru	Uwohereza mu mahanga

### 6.1.2 Ibikorera umusaruro wasaruwe mu gihe ubitse mu bubiko bwo ku murima

Muri rusange, ubushyuhe bw'umusaruro w'imbutu n'imboga buba bwenda kungana n'ubushyuhe bw'ikirere mu gice tubarizwamo cyegereye umurongo ugabanya isi mo kabiri, bukaba hagati ya dogere 25 na dogere 30 ariko bushobora guhinduka bitewe n'uko ikirere cyifashe. Mu bihe bimwe, ubushyuhe bushobora kuzamuka bukagera kuri dogere 38. Kuri ubwo bushyuhe bwo hejuru, uguhumeka kw'ibyasaruwe kuba kuri hejuru cyane. Uko gukumeka bizamuka (ni ukuvuga ubushyuhe bw'ahabitse umusaruro bwazamutse), ni nako uburambe bw'ibyasaruwe bugenda bugabanyuka, keretse iyo hari uburyo bwo kubihagarika mu maguru mashya. Niyo mpamvu ari byiza gusarura mu gitondo kare kugirango wirinde kubikora ubushyuhe bwazamutse kereka nyine igihe ubona ibisarurwa bigifite ikime cyaturutse ku mvura.

N'ubwo gusarura imiteja mu gitondo kare cyangwa nimugoroba ku kirengarenga aribyo byiza, hari igihe bidakunda cyangwa se ubushyuhe ntib'ubwe buri hasi nk'uko wabyifuzaga. Icyo gihe, ibyasaruwe bihita bikenera gukonjeshwa byihuse hakoreshajwe umwuka ku bushyuhe busabwa (Gukonjesha by'ibanze cyangwa guhoza) ari byo byongeraga igihe cyo kuramba nyuma yo gusarura mu gihe unabungabunga ubwiza bw'imateja yasaruwe.

Gukonjesha by'ibanze (Ishusho ya 64) bifasha mu kongera uburambe bw'umusaruro w'ibiribwa bibora vuba nk'imateja, imboga z'amababi n'imbuto zibora vuba nk'inkeri.

Kubera ko amashanyarazi ahenda cyane, ikiguzi cyo gukoresha inzu zifite ibyumba bikonjesha kiguma kiri hejuru, bigatuma amwe adakoresha mu gihe na none ibice bimwe biba bitegereye umurongo mugari w'amashanyarazi bikiri imbogamizi bitewe n'ikiguzi kinini cyo kubaka ahantu ho gukonjeshereza.

Ubu ikiri gukorwa ni ugushakisha ubundi buryo buhendutse, bwagabanya ubushyuhe bw'umusaruro wasaruwe mu gihe ugitegereje ko uza gutwarwa n'abohereza mu mahanga, muri ubwo buryo harimo nko gukoresha ibyumba bidakoresha ingufu z'amashanyarazi, gukoresha tekinoji ya kobaliti, ndetse no gukoresha ibyumba bikonjesha bikoresha imirasire y'izuba.

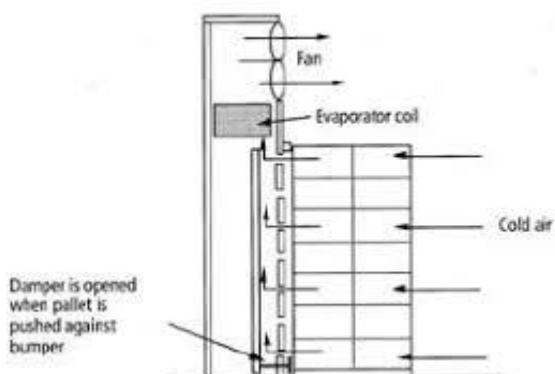
Ishusho ya 64 Ububiko bugezweho bwo guhorezamo umusaruro cyangwa kuwukonjesha by'ibanze



Ishusho ya 65 Icyumba kigezweho gikonjesherezwamo



Ishusho ya 66 Uko umwuka ukonjesha umusaruro utembera



Ishusho ya 67 Imodoka izanye imiteja idatwikiriye igeze ku nzu itunganyirizwamo umusaruro mbere kuwohereza hanze (18.9°C)



### 6.1.2.1 Gucunga ubushyuhe mu bubiko

Muri iki gihe, mu Rwanda hari amakusanyirizo yagenewe kubikwamo umusaruro yagiye yubakwa na Leta. Gusa biracyagaragara ko adakwiriye kuko abahinzi b'imbuta n'imboga bagiyeye batataniye hirya no hino mu gihugu.

Uburyo aho hantu hubatsemo hamwe ni amakusanyirizo, za hangari barobanuriramo umusaruro bawushyira mu byiciro, n'inyubako imwe yubate mu buryo bugezweho ishyirwamo umusaruro mbere yo koherezwa mu mahanga ndetse n'icyumba gikonjesha cyo ku kibuga cy'indege. Amakusanyirizo acungwa n'amakoperative cyangwa bimwe mu bishanga nabyo byashyirweho aho bibika umusaruro nk'ibyumba bidakoresha amashyamba, hangari zirobanurirwamo umusaruro mu gihe shyirwa no mu byiciro ndetse n'amakusanyirizo mato.

Kugirango ufashe ikonjesha, icyumba gikonjesha kigomba gushyirwa aho gisiga umwanya uhagije uvuye ku bibabambasi by'inzu kugirango bifashe gutembera nta nkomyi. Umusaruro ufite ubushyuhe bwinshi niwo ushyirwa kure y'urukuta ahateganye n'aho ubukonje buturuka kugirango biwufashe gukonja byihuse.

Buri gihe ujye wibuka kutarambika umusaruro hasi, koresha paleti za parasitiki cyangwa se amakureti arimo ubusa yagenewe kurambikaho ayandi arimo umusaruro (Reba ishusho ya 68 ikureti itukura iri hasi irimo ubusa irambitseho ayandi arimo umusaruro).

Ishusho ya 68 Umwanya uhagije hagati y'amakureti n'inkuta z'icyumba gikonjesha (umwanya wa cm 10)



Ishusho ya 69 Amakureti apanze nabi mu cyumba gikonjesha, ntiharimo umwanya hagati yayo n'inkuta ngo bifashe umwuka gutembera



### 6.1.2.2. Ingaruka nziza zo gukoresha uburyo bwo kuvana mu musaruro ubushyuhe uba wavanye mu murima no kuwongerera uburambe:

Kuvanamo ubushyuhe imiteja yavanye mu murima nyuma yo kuyisurura ni igihe cy'ingenzi kiyifasha kugira uburambe n'ubwiza bukenewe binyuze mu kugabanya ibijyanye no gukora kw'ingirangingo ziyigize nko guhumeka no gututubikana. Kuvanamo burundu ubushyuhe bwavuye mu murima bigerwaho ukoresheje ibyuma bihoza (gukoresha umwuka uwuhase) mu gihe gito gishoboka. Gukonjesha gake gake nabyo ni ubundi buryo bwakoreshwa, ariko umusaruro bitanga ntabwo ari mwiza cyane cyane iyo bisaba kubikorera ku musaruro mwinshi.

## 6.2 Isesengura ry'ibyumba bikonjesha

Uburyo bwo gukonjesha buriho ubu ntabwo bukora neza cyane cyane hagati yo kuva ku murima kugera ku nzu itunganyirizwamo ikanapakirirwamo umusaruro woherezwa mu mahanga.

Ku rwego rw'umurima, hari uburyo bwo gukonjesha butaboneye, gutwara umusaruro uva ku murima ujya ku nzu itunganyirizwamo umusaruro ukanahapakirirwa bikorwa b'imodoka zirangaye bityo ntibifashe kugumana ubushyuhe bwemewe kubikwaho umusaruro.

### 6.2.1 Ikiguzi n'inyungu biri mu gukoresha buri buryo bwifashishwa mu gukonjesha

Ikiguzi cy'ibanze cyo gushyiraho ibisabwa byose ngo hajyeho icyumba gikonjesha n'imashini zijyanye nacyo kiracyari hejuru, n'ubwo inyungu iva mu kubungabunga ubwiza no kugabanya ibyangirika n'ibihombo biboneka nyuma yo gusurura bifite inyungu kurenza icyo kiguzi mu gihe kirambye.

Ugukenera ibi byuma bikonjesha biri ku rwego rwo hejuru mu bohereza umusaruro mu mahanga kuko ari bake muribo bafite ubushobozi bwo kwiubakira ibi byumba bihenze cyane. 90% by'abohereza mu mahanga umusaruro w'ibiribwa bibisi bakoresha ibyumba bikonjesha bya Leta mu nzu itunganyirizwamo umusaruro ukanahapakirirwa ugiye koherezwa mu mahanga ndetse no ku Kibuga cy'indege, mu buryo baba bagabanyirijwe igiciro.

#### 6.2.1.1 Ibisabwa mu guhuza, kuvangura n'ikurikiranamusaruro mu bubiko

Imiteja ihuza n'izindi mboga rwatsi nyinshi kandi bishobora kuvangwa mu bubiko bumwe. Gusa, bisaba kwitonda kugirango wirinde kuvanga imbuto zisohora etilene nyinshi n'imateja igihe kirekire. Indabo ntizigomba kuvangwa na rimwe n'imateja.

Mu gihe cyo kubika umusaruro, kuvangura ni ingenzi cyane mu rwego rwo kutavanga umusaruro. Imiteja mitoya cyane n'imateja iringaniye ifite ibiyiranga bitandukanye bityo igomba gutandukanywa kandi

igahabwa ibirango bigaragara neza. Ibi bigomba gukorwa binyuze mu gukoresha amabara cyangwa ibindi birango bifite amabara atandukanye.

### **Gukurikirana inzira umusaruro unyuramo**

Buri kirundo cy'amakureti kigomba gushyirwaho icyapa kigaragaza umwirondoro w'umusaruro cyangwa ikirango gifasha kuwukurikirana. Aho bishoboka, ni byiza gushyiraho uturango tw'umwirondoro w'umusaruro kuko bifasha kugira umwirondoro w'umusaruro ku rugero rwo hasi rushoboka uhereye ku murima.

#### *6.2.1.2 Gupima umusaruro –Ibikoresho bikenewe mu gupima no kubara umusaruro*

Umusaruro wose uvanywe mu murima ugomba gupimwa kandi ugakorerwa igenzura harebwa ibyiciro ndetse n'uburemere bwa buri kimwe. Ibi bigomba kwandikwa kugirango harebwe ubushobozi bwa buri musomyi ndetse no kumva icyo ubuziranenge n'ubwiza bisaba.

## IGICE CYA 7: KWIKORERA UMUSARURO W'IMBUTO N'IMBOGA

### Ingingo nkuru zitaweho muri iki gice:

Muri iki gice, abasomyi baravomamo ubumenyi ku ngaruka zituruka ku buryo bunyuranye bwo gutwara umusaruro w'urusenda bukoreshwa ubu.

### 7.1 Kwikorera umusaruro w'imiteja

Ku miteja igomba kugezwa ku baguzi, igomba kugera ku masoko atandukanye ku gihe cya ngombwa kandi igifite ubwiza busabwa. Nk'uko nyine imiteja igomba gutwarwa nk'uko ibindi biribwa byose bitwarwa, ishobora gutwarwa n'abantu, inyamaswa, indege, ubwato cyangwa se mu modoka zigendera ku butaka. Mu bihugu biri mu nzira y'amajyambere, umusaruro wikorerwa inshuro nyinshi kandi hanakoreshejwe uburyo butandukanye uhereye mu bahinzi bato bo mu byaro hatari nyabagendwa, kuri za hangari aho ushyirirwa mu byiciro kugera mu mihanda minini, werekezwa ku nzu utunganyirizwamo, mu muhanda werekeza ku kibuga cy'indege werekezwa ku masoko yo mu biguhu bigize umuryango w'ubumwe bw'Uburayi no mu Bwongereza.

Igihe cyose umusaruro wikorerwa uvanwa ahantu hamwe werekezwa ahandi, uagenda ukorwaho, ukerererwa, wicugusa, utsikamirwa, cyangwa se uhura n'ibintu bitandukanye bishobora kugira ingaruka mbi ku bwiza bw'umusaruro bigatera mu buryo bumwe cyangwa ubundi iyangirika ry'umusaruro n'ibihombo mbere y'uko uwugeza ku isoko.

#### 7.1.1 Ibikoresho bisabwa, ubwoko bwabyo n'uburyo bwo kwikorera umusaruro wanyirika vuba

Hariho uburyo bunyuranye bwo kwikorera umusaruro kuva ku murima, kugera ku nzu utunganyirizwamo ukanapakirwa no kugera ku kibuga cy'indege. Uburyo bwiza bwo gutwara umusaruro ni ubukoresha imodoka zifite ubushobozi bwo gukonjesha kugirango ubushyuhe bw'ibicuruzwa bugume hamwe.

Ishusho ya 70 Torotoro yahinduwe kugirango ibashe gutwara umusaruro mu murima



Mu murima ubwawo, kwikorera imiteja cyangwa undi musaruro w'ibindi bihingwa bishobora gukorwa ukoresheje imodoka zitwikiriye cyangwa torotoro zikurura utuzu dutwikiriye. Iyo umurima ukoreshwamo amamashini, torotoro z'amapine atatu nazo zishobora gukoreshwa (Ishusho ya 70). Imodoka zikoreshwa mu kwikorera umusaruro ntizigomba kuba zikoreshwa mu gutwara imyanda kugirango zidatera ubwandu bwa mikorobe mu musaruro.

#### 7.1.1.2 Gucunga ubushyuhe mu gihe utwaye umusaruro

Ku murima, bishobora kudakunda gupima ubushyuhe bw'umusaruro mu gihe uri kuwutwara. Ariko rero, iyo nta modoka ifite icyumba gikonjesha ufite, ukaba ukoresha ifite igisanduku gifunze ariko kidakonjesha, ni ngombwa buri gihe kubanza kukirangaza nibura umwanya muto mbere yo gukiramwo umusaruro w'ibiribwa bibisi kugirango habanze hatemberemo umwuka ukonje.

Imodoka zidafite uburyo bwo gukonjesha zakagombye nibura kuba zifite uburyo bwo kwinjizamo umwuka ariko icyuma gikurura umwuka wo hanze kikaba gitereye ahantu hakwiriye kugirango ugabanye ingorane



zo kuba cyakurura ivumbi mu gihe utwaye umusaruro uwujyana ku nzu utunganyirizwamo mbere yo koherezwa mu mahanga nk'uko bigaragara mu ishusho ya 72. Imodoka zirangaye ntizigomba gukoreshwa rwose kuko zituma uburambe umusaruro wari kugira bugabanyuka ndetse ukanatakaza uburyo bwo kwirwanaho (Ishusho ya 73).

Ishusho ya 71 Imodoka ifunze neza ariko idafite uburyo bwo gucunga ubushyuhe

Ishusho ya 72 Imodoka irangaye idafite uburyo bwo kurinda umusaruro kwangirika n'abajura hakazamo n'inganruka zo kwanduzwa n'ivumbi



Ishusho ya 73 Imodoka yujuje ibisabwa mu gutwara umusaruro mubisi, urobanuye kandi upakiye neza



Gutwara umusaruro mu modoka ifite icyumba gikonjesha cyakagobye kuba ku bushyuhe bwa dogere 5 kugera kuri dogere 8.

#### 7.1.1.3 Isuku y'umusaruro n'ibisabwa mu isukura

Isuku n'isukura by'umusaruro ni ikintu cyo kwitondera cyane ku miteja. Ibi bintu bikurikira bigomba kwitonderwa mu gihe utwaye umusaruro uwuvana ku murima uwuzana ku nzu utunganyizwamo:

- Umutandiboyi ukora ku musaruro agomba kwitondera amabwiriza y'isuku;
- Imodoka igomba kuba ifite ubuzima bwiza kandi nta hantu na hamwe imena amavuta;
- Imodoka igomba kozwa buri munsi;
- Abakozi bakora ku musaruro bagomba kuba bafite imyambaro y'ubwirinzi yabugenewe, harimo ikote, ingofero n'uturindantoki.

#### 7.1.1.4 Gukuraho inkondo no kurobanura mu gihe cyo gupakira no gupakurura umusaruro

- Amakureti agomba kurambikwa ku ma palete cyangwa utundi tuntu twabugenewe duterekwaho amakureti mu gihe apakirwa mu modoka;
- Inkuta z'igisanduku cy'imodoka gishyirwamo umusaruro ntikigomba kubaho ivumbi kandi izo nkuta zigomba kuba zifubitswe n'akugara gafasha gukonja kugirango umusaruro ugume ukonje mu gihe cyose utwawe;
- Gupakira umusaruro, kuwutwara no kuwupakurura bigomba gukoranwa ubwitonzi.

#### 7.1.1.5 Ibikoresho byo gutwara umusaruro

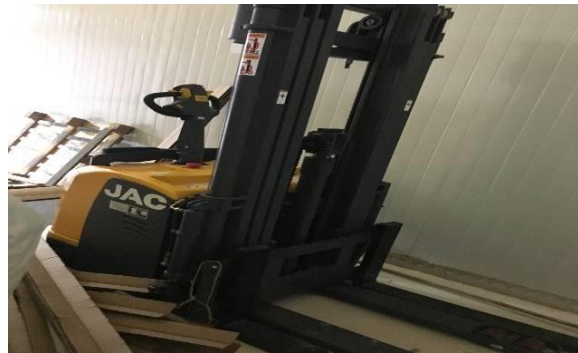
Ibikoresho byo gupakira no gupakurura umusaruro bigomba kuboneka kandi bigasanwa igihe cyose kandi bigomba kuba bibasha gukora icyo gikorwa cyo gupakira no gupakurura mu gihe gito gishoboka.

Ibikoresho byo gupakira no gupakurura bigomba kuba bikoze ku buryo butuma ibyo bikorwa bigenda neza. Utumashini duterura dukoresha gazi ntabwo ari twiza kuko dusohora ubushyuhe bigatera kuzamuka kw'ubushyuhe mu cyumba gikonjesha.

Ishusho ya 74 Akamashini gapakurura



Ishusho ya 75 Akamashini gaterura gakoresha amashanyarazi



#### 7.1.1.6 Kugira inyandiko no kubika amakuru

Inyandiko no kubika amakuru harimo inyandiko yo kohereza ibintu igaragaza amakuru y'aho byanyuze hose (Agapande k'umurima, uburemere, umurima n'itariki byasaruweho), uko imodoka yagiriye mu igaraje, igihe imodoka yakorewe isuku, amakuru y'ubushyuhe no kubika amakuru yose arebana nabyo kugeza ku bikoresho biteye imbere byo kugenzura ubushyuhe).

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